



Scuba Diver

AUGUST/SEPTEMBER 1990

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20-PAGE 1990/91

**DIVE STORE
DIRECTORY**

INSIDE

**AUSTRALIA'S TOP-SELLING
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DIVING VANUATU
IN STYLE**

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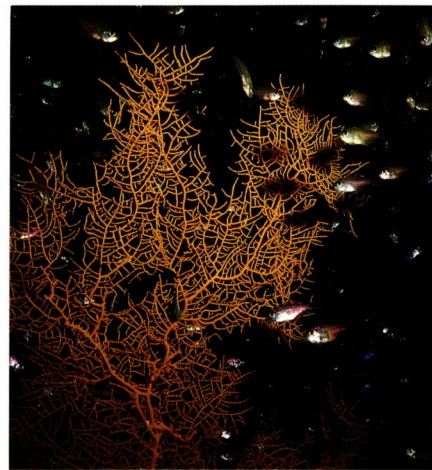


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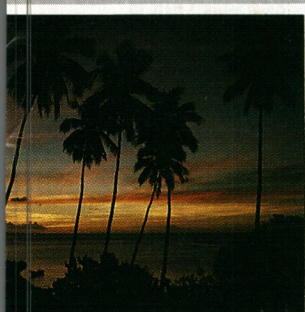
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Scuba Diver

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editorial

By the time this issue hits the newsstands, I hope to have met many of you at Scuba Expo '90, which is being held in Sydney this year. I've been attending the "biggest dive event in the Southern Hemisphere" since it was called Oceans, and I've always looked forward to it. It's a nice break in the middle of winter to check out the latest in dive gear, collect a few brochures on exotic dive travel and catch up with friends I don't see often enough the rest of the year.

This year, my involvement in Scuba Expo has gone beyond "casual diver buying a ticket at the door." It's part of my job now. In addition to working with the Diving Industry and Travel Association of Australia (DITAA) on the production of the programme, I am also working on our stand with the publisher, promotions staff and some of the field editors — the team behind *Scuba Diver*. We'll be out in full force to find out what you like and dislike about the magazine and to collect your ideas and suggestions for future issues.

If you miss this year's Scuba Expo, mark your diary now for next year's event, which will be held July 18-21 at Sea World on the Gold Coast. Scuba Expo '91 will be organised along the same format as previous years with a trade dinner, trade seminars, exhibition, marine art show and underwater congress and film festival. Events will utilise the facilities in the Sea World complex, including the World of the Sea Theatre and shark oceanarium. DITAA and Sea World are even planning dives on the Scottish Prince wreck near the complex. Isn't it a great (e.g. warm) location for a mid-winter break?

And, if I miss seeing you at the exhibition, I hope to meet you later in some of my travels this year. I plan to do more diving, attending club meetings and visiting dive stores in other states when deadlines permit. Don't forget — you can phone or fax me, too, with your suggestions or news.

Thinking of winter and new equipment at Expo is a good reminder to get your gear serviced, repaired or replaced. For some people, winter is the "off season" and an ideal time to have gear serviced. For others, it's the "holiday season", and all gear should be in top shape before you take off for a week or two. No sense ruining a trip because your reg died on some remote island or three days out at sea on a 10-day live-aboard trip.

Send regs, gauges, computers and underwater cameras out for service and check straps on mask, fins and snorkel for wear and tear.



The local schoolchildren on Pentecost Island willingly posed for photos on a recent trip to Vanuatu.

Every two years, send your watch out for a service and new O ring as well. Replace batteries in torches and camera strobes and replace any equipment that's seen better days before it lets you down in the water. Finally, restock your spares and first aid kits so you'll be ready for that next dive.

With the dive shop directory included in this issue, you have no excuse not to dive. There's a dive shop near you or your next destination in Australia, so keep the directory handy for the next time you travel up the coast or to a new area. This is our second year of compiling it, and we received a tremendous response to the survey. More shops, more details and more comments. I also receive queries from overseas about diving Australia, so I use listings from the directory in my replies.

Thanks to all of you who responded and helped make this effort a success. If you aren't on this year's directory and would like to be included next year, just drop me a note with the details.

Finally, there are several good travel features for those planning their next holiday and for the armchair travellers . . . New Guinea, Vanuatu, plus wrecks in Darwin and Western Australia. Hope you enjoy!



Cassie Welsh

letters

Misconception

In response to a letter published in the Feb/Mar '90 issue by June Moore, I would like to point out that not only does she have colour vision problems, but whatever she's read has been misinterpreted. The magazine contains as much colour as previous issues and some of the shorter articles are very fulfilling. I guess she's one of these motor-mouths that read *Women's Weekly* in 10 minutes and spends the next two weeks talking about it!

I must applaud Michael Cufer's attempt to blanket some of the idiot's comments, and I further defend his article by saying "Can June Moore do better?". I'm basically defending all your contributors' work, I would like to say that Michael's articles are some of the best I've read. Keep up the excellent work and ignore the bozos.

Alison Miller
Ramsgate NSW

Thanks for the comments and compliments. Letters like this go a long way towards chasing away the rainy-day, stuck-at-the-PC again blues.

Pollution Problems

I have been reading *Scuba Diver* for a while now and diving for around 18 months. I am rather concerned about the pollution of Sydney Harbour and beaches. I read your recent editorial and agree that something has to be done.

I have decided to study the pollution problems as a project. I was wondering whether you could send me information on the types of pollution, methods that can be adapted to help control pollution in the seas and ways that water pollution can be measured. If you don't have access to this information, would you be able to send me addresses of people/organisations that might be able to help me.

Thank you very much for your help. The mag certainly looks well done. You guys do a great job!

Gareth Stockley
Willoughby NSW

I heartily applaud your decision to study pollution problems and encourage you to become actively involved in trying to control the problem. We need more people like you.

If you're a PADI or NAUI certified

diver, both certification agencies have instigated a conservation program. Check with your local dive shop to see what you can do to help.

As for research material and resources, I can recommend an excellent book to get you started: Toxic Fish and Sewer Surfing by Sharon Beder. Copies are available from many bookstores for \$12.95. Following is a very abbreviated list from the book of organisations in Sydney that would welcome your support:

*Friends of the Earth (02) 211 3953
Greenpeace (02) 211 0500
People Opposed to Ocean Outfalls (POOO) (02) 977 6648
Turn Back The Tide Incorporated (02) 211 3501*

Again, thanks for your concern for the environment and look for more coverage on the subject in future issues of the magazine.

Pollution and Diving

I recently came home to Bondi after a three-week diving holiday in New Guinea. Diving a place like that does great things for the soul. I would have bored my friends with my heightened appreciation of natural beauty, but before the week was out I was back to my old cynical self, chronic morale deficiency in full swing.

I live near arguably the most beautiful harbour in the world, and three minutes from the most famous beach in Australia, yet before I dive any of the local sites I must seriously consider the risk to my health.

If I do choose to be rash and actually expose myself to the waters of the eastern suburbs of Sydney, I must consider the further fact that I'm unlikely to see anything anyway. Not that there's nothing to see, it's just that I'm not interested in other people's discarded rubberware, plastics and sewerage. There may be something wrong with my attitude, but I prefer wildlife.

The way industry and the Water Board have treated our piece of the Pacific in the past is unforgivable. Worse than any damage done under the guise of ignorance is that done by those who insist, while in possession of the facts available to anybody with eyes and a nose, that sewerage is not a problem and could not damage the environment if it tried.

Am I being unfair? Maybe people who insist that everything is alright have an olfactory complaint that makes the suburbs around Malabar smell like roses and hyacinths to them.

As a diver, I believe that the whole industry is in an excellent position to contribute to the growing surge of common sense sweeping the country. I know I feel responsibility as an individual to preserve and protect the seas, but I'm only one disgruntled diver. We must work together as a group or diving prospects by the year 2000 will look pretty grim and slimy.

Jeff Watson
North Bondi NSW

More Logbook Fans

I have been a fan of *Scuba Diver* magazine for about four years, and so has my family. I am writing to say how much I have enjoyed Diving's Logbook in the Feb/Mar 1990 issue.

My family and I even made a trip to Castlemaine to look at the record-breaking bell. We enjoy all of the Diving's Logbook articles as they make a nice change from the usual fish and Pacific travel stories.

Well done and keep up the good work.

Margaret Nettlefold
Coburg VIC

Women In Diving

Just received my latest edition of the mag in the mail. Thank you, it looks terrific.

Apropos your article on "Women in Diving" (and there should be many, many more of that sex in diving), I think that you made a rather glaring omission: Hans Hass had a secretary (later to become Lotte Hass) who had been told by her male chauvinistic boss that his latest expedition to the Red Sea was too dangerous "for women".

So in about 1954, she decided to prove him wrong. She crossed the Danube canal in Vienna in the middle of winter (by herself) under the ice! He relented, and she was his inseparable diving companion for the rest of their careers. More importantly, in 1957, she taught me to dive. The first female instructor?

Incidentally, she was gorgeous and the star of his movies. And, it was quite

possibly the first time that as a young (very, very young) lad I had lascivious thoughts.

When are you coming up to Matcham to dive the *Terriga*? The viz is better than in Sydney — this, I promise you.

Christian Gerzner
Matcham NSW

Thanks for the additional information on one of diving's most famous and filmed women. A profile on Lotte Hass might be a good topic for the future. And, thanks for the dive invitation, an offer I hope to take you up on soon.

Heron Island 1990 Festival

What a wonderful time I had at the Heron Island Dive Festival last October. The highlight of the festival had to be the guest speakers who introduced me to a whole new world under the sea. Each dive became an underwater adventure.

Walt and Jean Deas, underwater filmmakers, authors and still photographers, introduced us to underwater cinematography. Reg Lipson, one of Australia's best known diving personalities, entertained us for hours, not only with his amazing knowledge of marine creatures, but also with his understanding of the relationship of their strange behaviours to that of man. Peter Corkeron, who is a specialist in whales and dolphins, shared with us the results of his recent research on humpback whales in the Hervey Bay region off the Queensland coast.

Dr Bob Thomas spoke on the latest dive medicine research and information. Neville Coleman, who is a producer and editor of *Underwater Geographic* magazine, delighted us with several slide showings and tales of his underwater travels. Neville also ran a successful Nikon School of Underwater Photography and offered encouraging advice to all those who entered the photographic competition.

So, if you're looking for a superb diving holiday, which also includes great food, wine and entertainment, excellent service and friendly staff, the Heron Island Dive Festival for 1990 is 10-17 November. See you there!

Rana E. Jewell
East Brisbane QLD

scuba sites

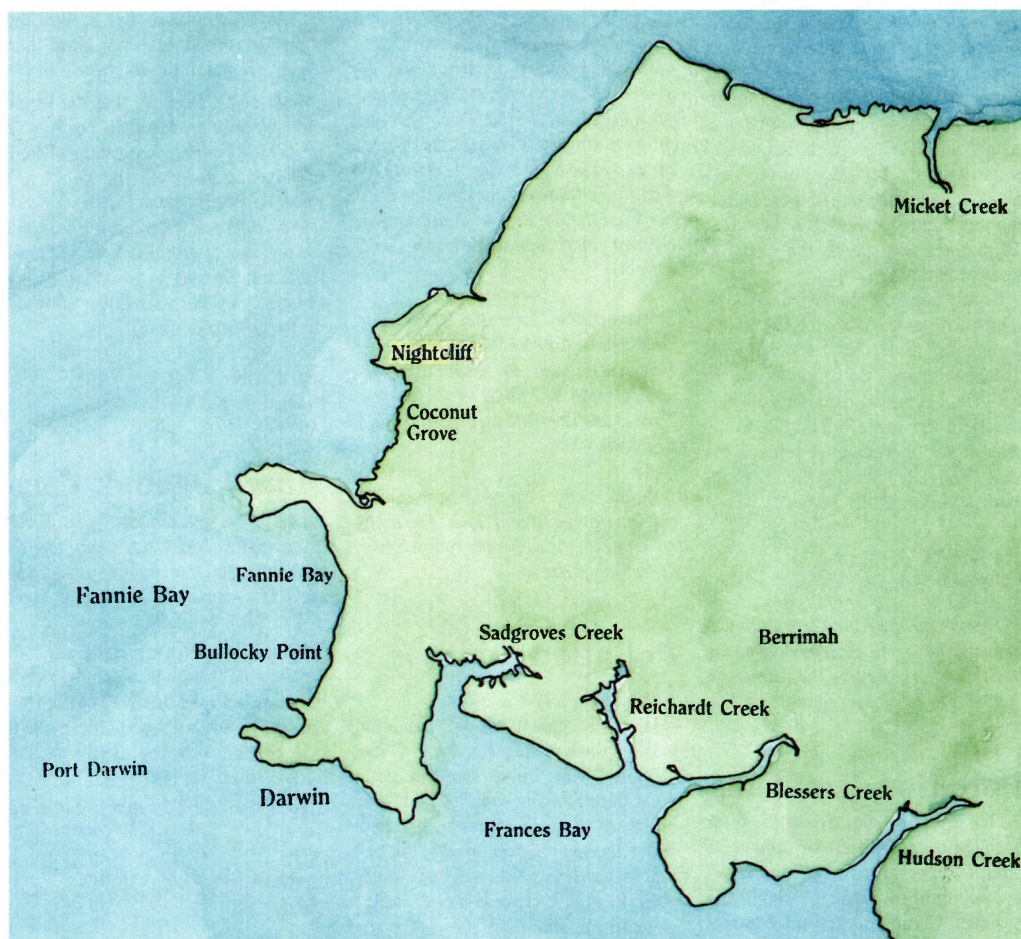
by Tom Lewis

Darwin, Northern Territory

You're moving to Darwin. The temptation to sell your diving gear and go into voluntary scuba retirement for at least a few years inevitably crosses your mind. You've heard tales about the bad visibility, the eight-metre tides, and of course, the crocodiles. The stories get worse until eventually until you climb on the plane with tales of fifteen-metre monsters ringing in your ears. The first thing you see in Darwin is a newsagent selling (genuine!) crocodile insurance vouchers. Your \$800 regulator will be up for sale next weekend.

Of course the stories aren't completely true. Okay, we do have big tides, but the visibility *can* sometimes resemble Heron Island on a bad day — outside our harbour. And the crocodiles at least keep away the sharks. But, after a few months divemastering for local instructor, Sasha Muller, and hearing of sunken ship after sunken ship, I slowly began to think of Darwin not as the "crocodile corner", but as the "wreck capital" of Australia.

The remains of 30 ships and aircraft lie within half an hour's boat ride from the main city wharf. If you're ambitious and find a bigger boat, there's another 20 or so outside the harbour limits. With a genuine, unexplored Japanese submarine, various military aircraft, fishing trawlers and World War II ships in



Peter Allen/Aquaphoto

A Harley Davidson motorcycle, encrusted with marine life, is barely discernible on this WWII wreck.

the collection, you can dive in Darwin every weekend for a year and still not have given the place the diving attention it deserves.

The origins of all of this marine miscellanea lie in the Top End's turbulent history. Numerous cyclones, war, and simply the fact that Darwin has always been a very busy, deep-water harbour mean that over the years the seas of the Territory have closed over more craft than even Tasmania's infamous west coast. And, despite the best efforts of a small but enthusiastic band of local scuba divers, the swirling waters still hide a few lost wrecks for the romantic adventurer.

World War II's first attack on Australian soil in 1942 sent numerous vessels to Davy Jones's Locker when a Japanese carrier group launched their planes against a crowded Darwin Harbour. Two hundred and forty-three people were killed in the raid that

February morning by the same task force that had attacked Pearl Harbor a few months earlier.

After a shipping convoy's retreat to Darwin, the port was crowded with vessels: ships transporting supplies to and from Darwin or simply refuelling. On the morning of the 19th, Darwin Harbour held 45 ships. Just before 10 am, the first bombs fell on the unprepared city. When the Japanese aircraft finally landed on their carriers three hours later, they left the town in ruins and the port waters covered in burning oil and petrol. Smoke was billowing over buildings from the massive explosion of depth charges on board the supply ship *Neptuna*, which had been moored at the wharf. Other ships were beached or burning, and seven vessels sunk.

The United States destroyer *USS Peary* had been bombed, with the loss of 80 lives, and guns still firing as she went down. The RAN lugger *HMAS Mavis* was sunk by a near miss. Australian coal hulk *Kelat* had been machine-gunned and was slowly settling. The English tanker *British Motorist* had received two direct hits, then caught fire and capsized with two men killed. The Australian coastal trader *Zealandia* was bombed, burned and sunk with the loss of three men. US Armed Transports *Mauna Loa* and *Meigs* were also sunk with the latter being hit several times, finally catching fire



Peter Allen/Aquaphoto



Peter Allen/Aquaphoto

The author explores the prawn trawler *Dieman*, which sank in the harbour during Cyclone Tracy on Christmas Eve, 1974.

The 20-metre steel trawler, *NR Dieman*, is one of the most photogenic wrecks in the Northern Territory.

and sinking. At 12,568 imperial tons, she was the biggest ship in the harbour.

Some 40 kilometres away on the same day, the Japanese sank the freighters *Don Isidro* and *Florence D*. The extent of all this devastation comes as a surprise to Darwin visitors: news of the raid was suppressed in southern capitals for fear of panicking the population. Many people attached more significance to the Japanese attack on Sydney Harbour with midget submarines.

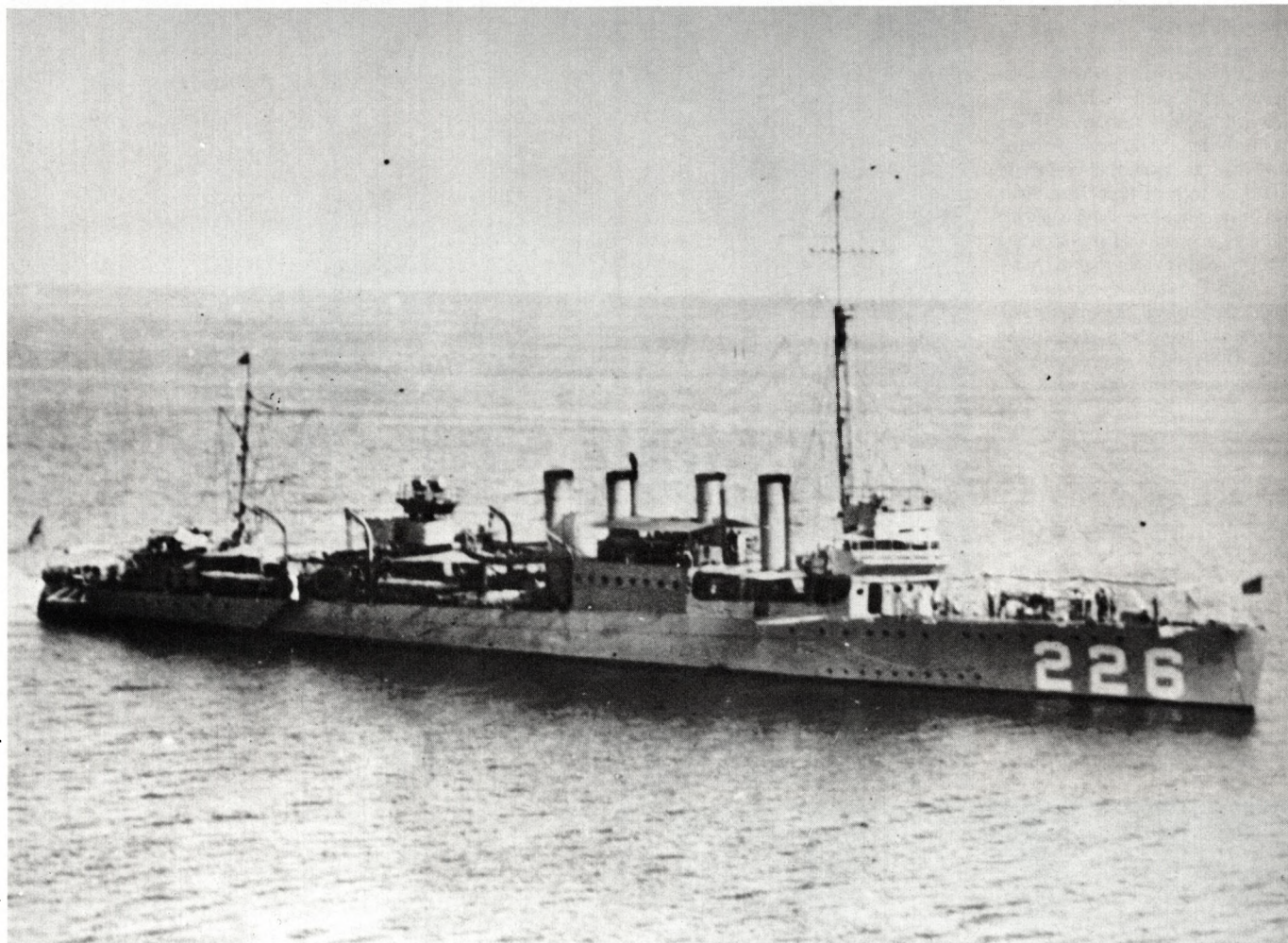
Despite the fact that World War II vessels were extensively salvaged in 1960, enough remains on the wrecks today to make interesting dives. At the convenient depth of 18 metres, a scuba-equipped explorer can spend a happy hour or so turning over old military equipment that never made it to the Pacific war. The wrecks are scattered

over the seabed in vast heaps of metal. The debris consists of hull plating and spars, with many smaller items you can pick up for examination. Supply cylinders for the salvors' cutting torches have been left behind by the salvage operators, and each shipwreck site is full of bits of scrap metal and more distinguishable war supplies.

A number of fan corals and soft sponges have grown on most of the locations, the home now of many brightly coloured coral fish to be seen, often in clouds dense enough to obscure your view. Sometimes a barracuda makes an appearance, usually cruising a few metres above divers' heads as they fossick.

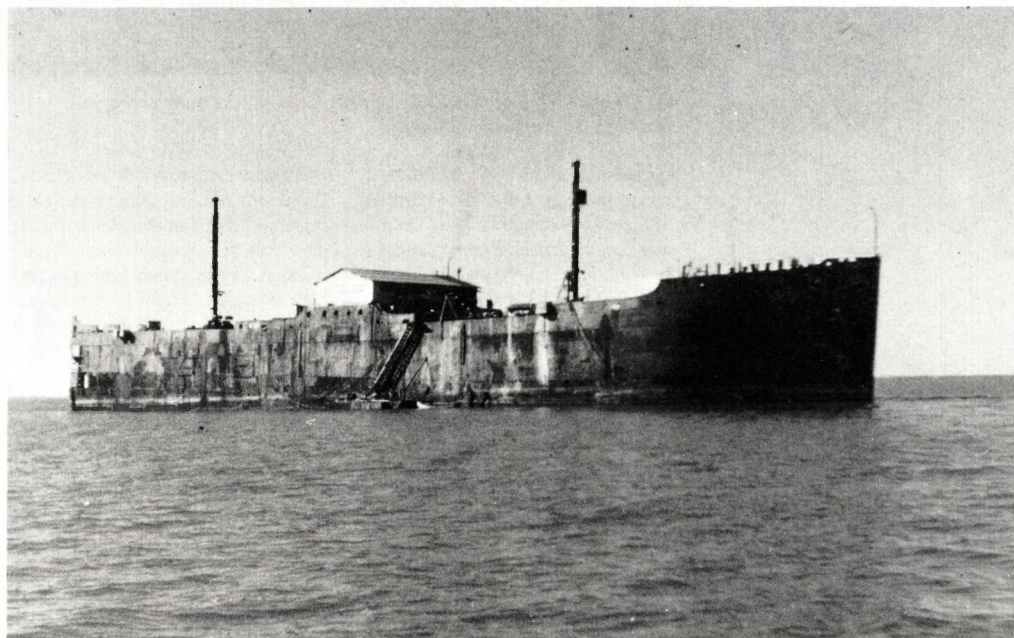
What's left of the war vessels' cargo receives the most attention from divers. It's quite easy on these wrecks to find ▶

Courtesy of the United States Navy



The *USS Peary*, an American destroyer, was bombed by the Japanese and sunk in Darwin Harbour in 1942.

State Reference Library of the Northern Territory



The tanker, *British Motorist*, was gunned down in 1942 and raised again in 1960 after being salvaged.

“bullet dumps” of many hundred .303 calibre cartridges, packed into cardboard boxes that have long since washed away. Occasionally .50 calibre ammunition are also found. A Harley Davidson motorcycle can be located on the *Mauna Loa*, and small troop carriers on both this vessel and the *Meigs* are favoured photo spots. The refuelling vessel *Kelat* still features large lumps of black coal, as well as several wobbe-gong and many varieties of tropical marine fish.

Several unexploded shells lie scattered amongst the debris of the larger ships. These are a recognisable projectile, being about 40 centimetres long with a tapering nose and fins. They are thought to be mortar shells bound for the Philippines. Most have been removed by Navy clearance operations, with the last search being conducted during “Kangaroo 89.” All are given a wide berth by wary divers, as it’s said pressure change resulting from movement could lead to more than a few perforated eardrums.

On the remains of the sunken destroyer *Peary*'s divers sometimes find the large brass shell casings from the big guns. The *Peary*' descendant, a modern United States destroyer of the same name, visited the port during the August '89 military exercises, and local divers Warren Allen and Phil Franklin presented the Americans with one of the shell casings and the ship's wardroom keys. Phil, a Darwin Sub-Aqua Club stalwart, has built up an impressive collection of such items, including morse code keys and an engine room telegraph.

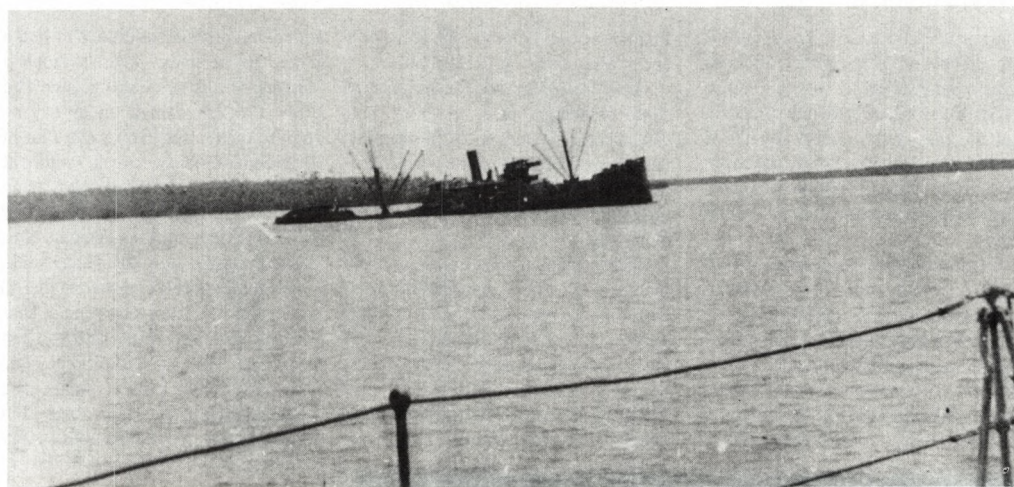
Aircraft such as flying boats, Japanese and Allied bombers and various fighter planes, all have met an end in the Darwin waters. One of the best dive wrecks in this category is a Catalina seaplane about five kilometres from the city. Twelve metres down there's almost a complete "Cat" resting with one wing crumpled underneath her and the big tail torn off. The nose — detached from the fuselage — is free of the sand, and one wing is entirely clear of the seabed underneath, pointing up at 30 degrees towards the surface. The plane's flaps and aerilons are easily distinguished.

The aircraft's cockpit is perhaps the most interesting section to examine. The pilots' controls are still in the cockpit, two large steering wheel structures with the top of the circle missing. The windscreen and parts of the cockpit canopy are also in place, although broken.

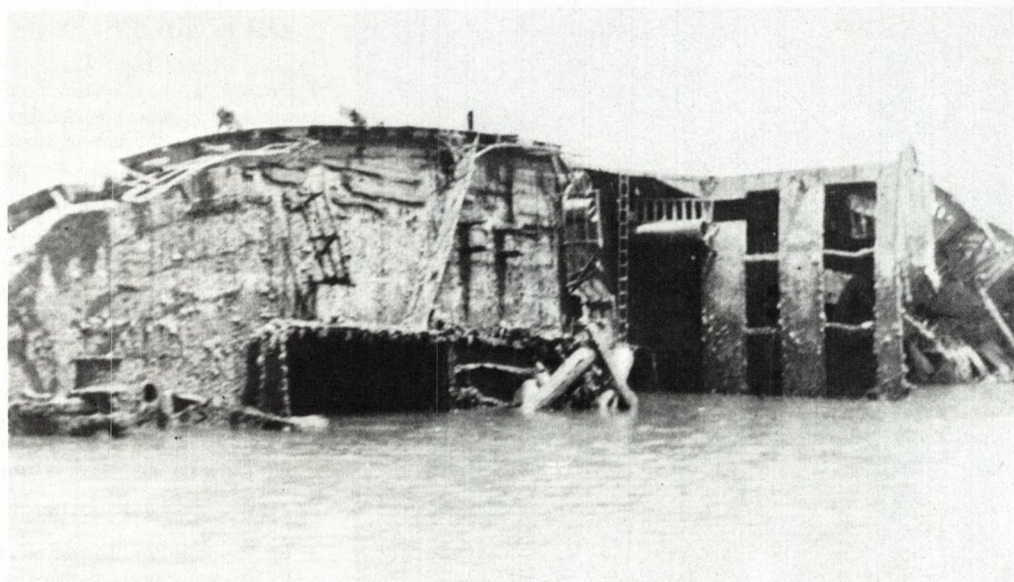
Forward of the control area is the front gunner's position with a large circular toothed rim. A hinged seat is folded down inside the turret. The two huge engines are also worth investigating, with the propeller blades on the giant 18-cylinder motors bent back by the force of the crash impact. These big seaplanes, carrying a crew of eight men, were based in Darwin for mining, bombing and reconnaissance work throughout Asia during the war. Another three Catalinas lie nearby, with one visible on the mud at low tide.

After a gradual rebuilding following the war, Darwin was again flattened by Cyclone Tracy on Christmas Eve, 1974. Ten thousand houses were wrecked, over 1000 people were treated for injuries and 35,000 Darwin residents left town after the cyclone left the city looking like Hiroshima. Wind gusts of 217 km/h were recorded at 3.05 am on Christmas morning before measuring equipment ceased to operate.

Many of the 40 manned vessels in the harbour were put to sea in attempt to ride out the storm. Six returned to the wharf the next day; the rest ran aground or sank. Fifteen men died in the water, and several vessels are still listed as



Three lives were lost on the *Zealandia*, on Australian coastal trader that was bombed and burned in one of the first attacks on Australia soil.



Smoke filled the town when the *Neptune* was bombed because of the massive explosion of depth charges onboard.

missing. The three-masted, 35-metre schooner *Booya*, the ferry *Darwin Princess* and several smaller boats have never been located.

Many vessels were immediately salvaged in the massive rescue effort by the Navy, Army and emergency forces that held Darwin together over the next three months. Vessels such as the patrol boat *HMAS Arrow*, which ended up under the Darwin wharf, were raised or refloated. But many wrecks were "written off" and left where they sank. Today, several prawn trawlers, a sunken ferry and other boats provide divers and fishermen with plenty of interest.

Near the Darwin port installations, the trawlers *Bellbird* and *Bluebird* provide straightforward dives at 10 to 15 metres. Both simply consist of inverted hulls with little cabin structures remaining, but both wrecks have attracted fair

fish life such as large rock cod. The *Bluebird*, directly out from Darwin Esplanade's big white Atrium hotel, is canted at an angle and generally offers the better dive. Portholes, navigation lights and fish sorting trays can be distinguished.

Over at the other side of the harbour is one of the most photogenic wrecks in the Northern Territory, the 20-metre steel trawler *NR Dieman*. She lies on a sandbank upright, with her bow rammed into the shore's gentle slope of sand. The hull is intact, although parts of the cabin superstructure have collapsed on top of it. Visibility on the wreck is usually fair by our standards: perhaps five metres on a good day. The bottom of the boat's hull lies at 10 metres depth and is worth a preliminary circuit after descent to check out the fish that live in the cavities under the

hull. The deck of the trawler lies some four metres higher.

The *Dieman* is one of the best wrecks in the harbour for observing fish life. Apart from schools of small fish, the trawler is home to several large rock cod, some of which look as if they weigh close to 20 kilos or more, and these can almost be hand-fed. Tuna, turrum, barracuda and the occasional small tiger shark can all be seen, and inside the wreck itself are several eels. Wreck penetration is not possible to a great degree, though chain and equipment lockers at both ends of the boat are worth an investigation.

Nearly 50 Vietnamese refugee boats arrived in Darwin from 1976 onwards, fleeing the new rule in their country. The *Song Saigon* and *Ham Luong* lie together in the centre of the harbour, having been scuttled some time after

SCUBA SITES *continued*

their arrival in the port. These vessels are almost completely intact, and safe wreck penetration is possible. Care needs to be taken to avoid stonefish, but the rest of the underwater life is prolific. Many small yellow trumpetfish, coral trout, flathead and the occasional giant batfish have made the wrecks their home.

Even more lies outside Darwin Harbour. A famous wreck that arouses furious discussions now and then is the Japanese submarine *I-124*: a designated war grave and therefore not diveable. Somewhere in the same patch of water lies the missing freighter *Florence Dee* and many more wrecks besides: vessels

that went down before 1939, steamers and sailing ships big and small.

There's the *Brisbane*, for example, a cargo passenger vessel on which you can still find the odd bit of Chinese pottery. Some deliberately sunk wrecks like the freighter *Marchart* are fast becoming homes for fishlife. So, do all these ships keep us happy?

Well, visibility is sometimes up to 20 metres in the "Dry," but often far less than that. An extended trip outside the harbour will yield much better viz for desperate Queenslanders. Diving within the port area, you quickly find out there's sufficient silt in most wrecks to enable kicked-up clouds of dirt to

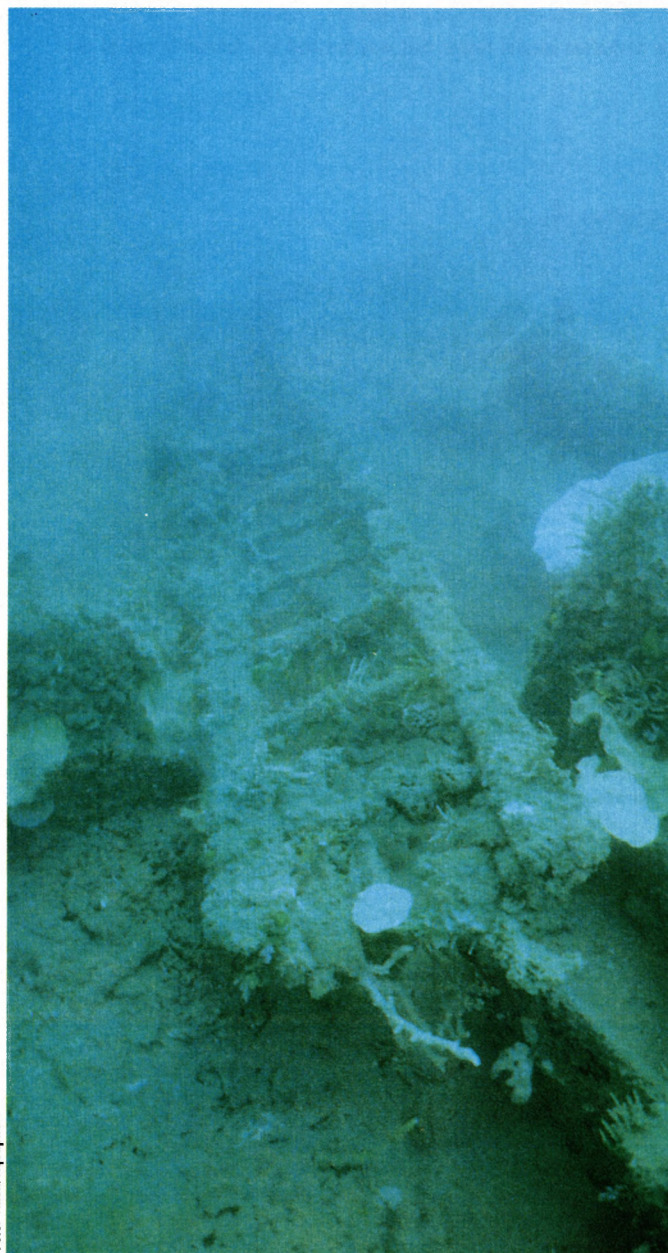
reduce even good conditions to half a metre in seconds. There's tropical stingers, of course, though anyone who dives from Bundaberg on up will be used to those. But there's not a lot of great coral if that's what you're into, at least inside the harbour. My diving mate, Sasha, reckons nearby East Point has good coral, but then again he likes diving the caves down the Track south.

Besides 30 thirty or so wrecks, there's a few other attractions to living in Darwin. We dive year round and you can leave your 5mm wetsuit at home. The Top End lifestyle is great. A favourite pastime is sampling every restaurant in town because there's just about every

ethnic cuisine imaginable represented here in the most multicultural capital of Australia.

But, in the end, it comes back to that first question. You still want to know about large biting monsters? Well, if you insist on a photo, a couple of us have this crocodile suit . . .

A teacher and writer, Tom Lewis recently completed a series of articles for the NT NEWS on the history of shipwrecks in the Darwin area. While he and his wife Terry find Darwin an exciting place to dive, their favourite spot has to be Vanuatu for its variety and visibility.



Peter Allen/Aquaphoto

The boarding ladder on one of the WWII wrecks in Darwin Harbour.

TRAVEL INFORMATION

DIVE SHOPS

Coral Divers, Shop 1, 42 Stuart Hwy, Darwin. Telephone and fax (089) 81 2686. NAUI dive education courses include regular local marine scientific study sessions. A continually changing weekly timetable of boat dives to locations in the harbour and beyond in a fast tri-hull. Air fills, equipment sales and hire, local information. Call in and talk to Sasha Muller or one of the staff. Open seven days a week.

Fannie Bay Dive Centre, Shop 9, Fannie Bay Place, Fannie Bay. Telephone (089) 81 3049, fax (089) 81 4913. Darwin's largest dive centre with instant airfills, two air-conditioned lecture rooms, 3-metre deep training pool and a modern showroom. A PADI 5-star centre. Boat dives aboard 8.6-metre *MV Louise* to all wreck and coral dives in the harbour. Out of harbour trips in 15-metre vessel *MV Gramps*. Open seven days 8 am-6 pm.

Sand Pebbles Dive Shop, Delatour St, Coconut Grove. Telephone (089) 85 1906. Sand Pebbles offers training to instructor standard, dive charters, air fills and equipment sales, service and hire. This shop claims the record for the longest-running dive shop in Darwin.

DIVE CHARTERS

Fathom Five Pro-Charters offers local boat trips in *Oceans*, surveyed for Darwin Harbor and sheltered waters beyond. Dive equipment and NAUI open water instruction available. Contact Trevor Hosie at 13 Sabine Road, Milner or on (089) 85 4288.

DIVE SEASON

Darwin divers are in the water all year round, though the best visibility's in the "Dry Season", from May to October, when the monsoon rains cease and silt isn't continually carried down to the sea. Tropical temperatures mean a lycra suit year-round, though some divers prefer a 3mm suit in the cooler "Dry". Box jellyfish mean full body cover in the "Wet".

BOAT RAMPS

While Darwin has plenty of boat ramps, people inexperienced in waters this far north need to be aware of the huge tides. If you come back too late, you may find the bottom of the ramps above the waterline.

Darwin Ski Club Ramp. Near the Club at Bullocky Point, Darwin. Double separate ramps next to sand beach. Takes boats to seven metres.

Catalina Base Ramp; Berrimah. Ex-WWII, wide single ramp, takes large boats, though end exposed at low tides.

Nightcliff Boat Ramp. Serves the northern suburbs. Can present problems, especially in windy conditions. Rocks nearby. Takes small to medium boats.

Dinah Boat Ramp. An alternative to the Ski Club ramp if winds are giving problems. Sheltered from weather conditions.

dive debrief

by Bruce Iliff

Making Your Own Weights

Making your own weights is a satisfying exercise that can also save you a few dollars. Finding the lead is the fun part. If there is a local diving spot in your area that is also popular for fishing, keep your eyes open for lead sinkers to mould into weights.

You don't need much equipment. The most expensive part is the mould, which is around \$15.00. They come in different shapes and sizes, but the best one is the three-pounder because the others have complicated curves and

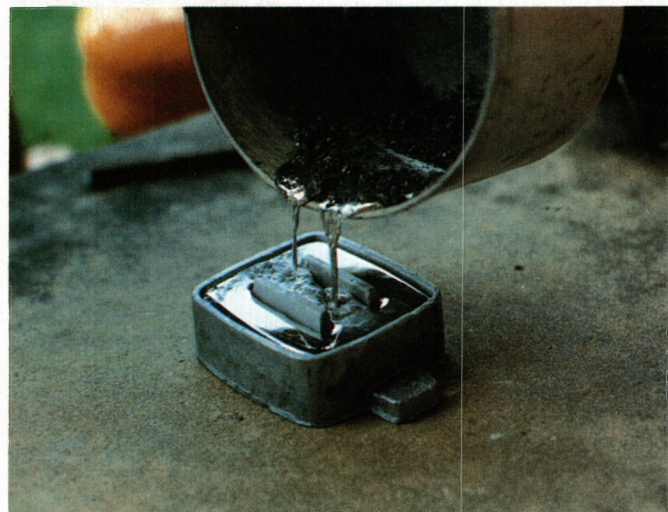
edges. This size is also more versatile to use when diving.

You'll need an old aluminium saucepan large enough to hold the lead. Aluminium has a much higher melting point than lead, so the lead will melt before the saucepan. A standard gas camping stove will give off enough heat.

A ladle to transfer the molten lead from the saucepan to the mould can be made from an old tin can. Form a spout in the lip of the can and bend a piece back to make a handle. Have a pair of



For equipment, you need an old saucepan to hold the lead, a camp stove for heat and a mould of the desirable shape and size.



When the lead is completely melted, fill the mould and allow it to cool.



Once cooled, the weight can be tipped out of the mould and painted or marked to customise it.

pliers or multigrips handy because the ladle filled with molten lead will get hot.

Before starting, check that the lead is clean, there is no fishing line still stuck to the sinkers and the holes aren't filled with sand. Put the lead in the saucepan and turn on the heat. Six pounds of lead will take about 15 minutes to melt, but this will vary depending on the shape of the saucepan and the heat generated by the stove.

Before the molten lead is put in the mould, ensure the mould is completely dry. Any moisture will instantly vaporise and explode on contact with the molten lead, spraying hot, molten metal. To ensure it is dry, hold it over the flame for a few seconds.

Use the ladle to transfer the lead or pour from the saucepan, then let the lead sit in the mould for a few minutes before pouring it back into the saucepan. This is done to heat the mould, cooling the lead more uniformly so no air bubbles get trapped. The mould can also be placed over a flame to heat it up.

When the lead is completely melted,

fill the mould again. Leave it for a few minutes, then place it in a container of cold water. This cools it down enough to handle. Tip the weight out and you'll have a perfectly good weight, which can now be painted to make it distinctly yours. If you have access to letter punches, you can further customise it with your initials.

If there isn't enough lead to make a full three-pound weight, try making a one and a half-pounder. Then after a few more dives and a few more recovered sinkers, you can remelt it to make a three-pounder. This smaller weight might even come in handy if your buoyancy is right in the middle where three pounds is too much.

Diving seems to consume money faster than you can consume an 88 cf tank. Making your own weights is one way to get a bit back from the sport.

A Queensland resident, Bruce Iliff has extensive experience as a divemaster helping new divers become experienced divers.



diving's logbook

by Jeff Maynard

Australia's Human Torpedo

After last issue's article on the Italian two-man "chariots", I had planned to follow up with the British development of the chariot in the Second World War. Since then, however, I've come across information about an underwater chariot that was built before the Italian "pig boats" of 1917. Even more interesting is the fact that this one-man torpedo was designed and made in Australia — and there's evidence to suggest it may have even been sold to the Germans before the First World War.

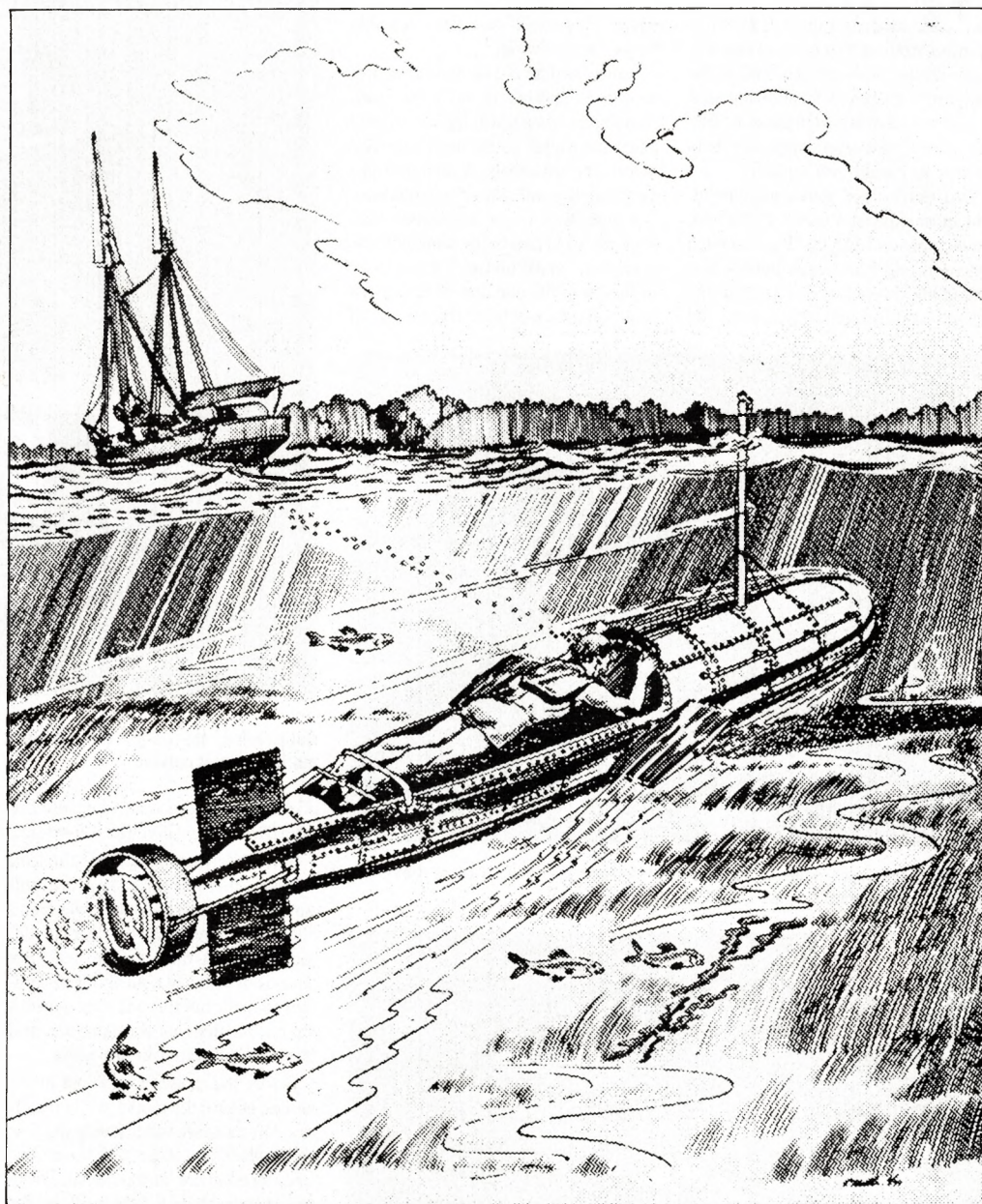
This fascinating story takes place in South Australia in 1890 when a 29-year-old Icelandic sailor, Christian Montcalm Madson (or Matsom), jumped ship at Port Germein. After working at various jobs, he settled at the Birkenhead district in Port Adelaide and changed his name to Christie Calm Dale.

He prospered in Port Adelaide, operated a number of vessels and gained his master's coastwise certificate, which transformed him into Captain Dale. He also married and eventually had seven children. It was this Captain Dale who became an inventor and was responsible for building a workable human torpedo around 1905.

To understand why anyone would put so much energy into developing a human torpedo just after the turn of the century, we need to understand that torpedoes were a new means of waging war and of great concern to navies around the world. In the previous decade, the submarine had virtually gone from a novelty to the most feared craft on the seas. The idea of a vessel that could approach a ship silently and submerged, then sink it with torpedoes, sent shivers up the spine of every man in the navy.

What made the threat more imagined than real was the inaccuracy of contemporary torpedoes. To get off a good shot, a submarine had to manoeuvre very close to a ship and even then the torpedo would miss more often than not. Complicating this was the fact that these torpedoes were very slow, so ships were often able to simply outrun them.

But the idea of being able to approach a ship concealed, then blow it out of the water was a very attractive one. So inventors were looking at ways



A sketch of Captain Dale's human torpedo, which was built and tested in Adelaide, South Australia around 1905.

of overcoming the problem of torpedoes missing their target.

Captain Dale's answer was to have someone ride the torpedo to within striking distance of the ship, then dismount and send it on its way. Working in his Port Adelaide backyard, Dale,

along with an electrical engineer named Metheringham (or Etheringham), built a submersible missile.

Dale's torpedo was made of copper and was six metres long. It had a shallow depression on the top of the after part where the operator would lie on

his stomach and manipulate the controls. Exact information about how the torpedo was powered is not available, although it is known that the operator worked a joystick that controlled three forward gears and one reverse. Although one report mentions a petrol

engine, the torpedo was probably powered by batteries.

The operator wore a life preserver and shorts and had no breathing apparatus or face mask. He held himself to the torpedo by means of a bar across the ankles. This bar left the feet free to operate the rudder. The operator's elbows were held in a fixed position by the control levers of the two midship hydroplanes. The propeller was enclosed so that when the operator slid his ankles out from under the bar and sent the torpedo on its way, he wouldn't be injured by the revolving screw.

At the front was an explosive warhead. The torpedo sped along with an undulating wave-like action. Without the operator, it was three-quarters submerged. With the operator aboard, it rested just below the surface.

The first operator, and possibly the first operator of a human torpedo, was Captain Dale's 12-year-old son, Alan.

Alan Dale, who has since died, was an old man in the early 1960s. He explained to Chris Halls, then curator of the Port Adelaide Nautical Museum, that the torpedo could be easily controlled once it was underway. He said

it did have a tendency to dip, but that this could be rectified by using the hydroplanes.

A single navigational light was mounted forward on an upright pole for the purpose of trials. These trials took place with Alan as the "charioteer", in the North Arm of the Port Adelaide river. The torpedo was loaded aboard Captain Dale's ketch *Hecla* (named after Mount Hecla in Iceland where Dale was born). The first trials were carried out in front of naval staff in utmost secrecy.

The naval staff were unimpressed except for one Commander Burford who, believing the human torpedo had potential, urged Captain Dale to submit his invention to the British Admiralty.

It is here that some controversy, or at least confusion, enters the story. Captain and Mrs Dale booked passage on the liner *Bremen*, which left for Europe on March 9th, 1907. Their destination was, ostensibly, London and the British Admiralty. But Captain Dale spent three months in Bremen, Germany and afterwards reached London. After London, the Captain and his wife spent a year travelling the world, staying in expensive hotels. They visited the Cap-

tain's relatives in Iceland and returned to Adelaide in 1908. Captain Dale was not a rich man and it may be assumed by his year long "holiday" that while in Europe he sold his invention and travelled on part of the proceeds.

Did he sell the human torpedo to the Germans or the British? His activity during his three-month stay in Germany is unknown, except that during this time he sent his son, Alan, a toy metal submarine. Was it possible that he sold his invention to the Germans who, finding the waters of the North Atlantic too cold to operate it, passed the design on to their allies, the Italians, who could use it in the warmer waters of the Mediterranean?

The answer to such a question will never be known. But it is interesting to speculate that the first human torpedoes or "chariots" may have been conceived in Australia.

The British Admiralty has no record of Captain Dale and attributes the first suggestion of manning torpedoes to Commander Godfrey Herbert in 1909 — a full year after Captain Dale had returned to Australia. Incidentally, Herbert's idea was turned down by the then

First Sea Lord, Winston Churchill.

After Captain Dale's return to Australia his prototype was often run on the Adelaide River. Alan said he came to look upon it as a kind of toy.

In October 1915, the *Hecla* collided with the harbour's stone wall and the torpedo, which was lying amidships, rolled off and was lost. It has never been recovered. Captain Dale died in 1945, aged 84.

For the information in this column I am indebted to Chris Halls who interviewed Captain Dale's son, Alan, during the late 1960s. Much of the information is taken from Alan's personal reminiscences. The illustration of what is possibly the first ever human torpedo was drawn by Chris Halls, and its authenticity verified by Alan Dale.

Anyone wishing to see some link with this chapter of Australia's fascinating underwater history can do so at the Port Lincoln Maritime Museum in South Australia where the hull of Captain Dale's *Hecla* is on display.

Jeff Maynard is a professional writer and dive historian whose favourite dive spot is the President Coolidge.



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by PETER GILLAN



48-25

fish facts

by Robert Berthold

Striped Catfish *Plotosus anguillaris*

It's an amazing sight — a writhing mass of slimey black and white bodied fish moving slowly through the water column, twisting and turning, milling up and down as they follow the undulating profile of the estuary floor. This is the conspicuous lifestyle of the amazing striped catfish.

Most species of catfish are nocturnal and spend the daylight hours hiding, waiting for darkness to start their foraging activities. The striped catfish is the exception to the rule as they can be seen in broad daylight in their special schools called "pods", which consist of hundreds of juvenile fishes out searching for crustaceans, worms and small molluscs on which they feed.

Ever asked your dive buddy after a dive if he saw that school of fish that swam overhead? The reply might often be, "What school of fish?". This could never be the answer to your question on a dive where a school or pod of striped catfish appeared. Once experienced, never forgotten.

Adult fish reach a maximum of 91cm, but fish of this size are rarely caught and even less often encountered underwater. The schools of fish I've mentioned above are much smaller in size and have dark brown bodies with creamy white stripes running the full length of the fish. As the fish mature, the stripes become less conspicuous.

The head has six sensory barbels or



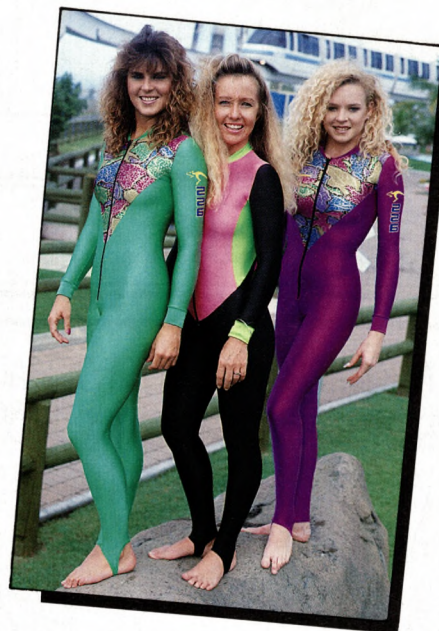
Striped catfish have needle sharp, double-edged serrated spines that can inflict painful wounds on the unwary.

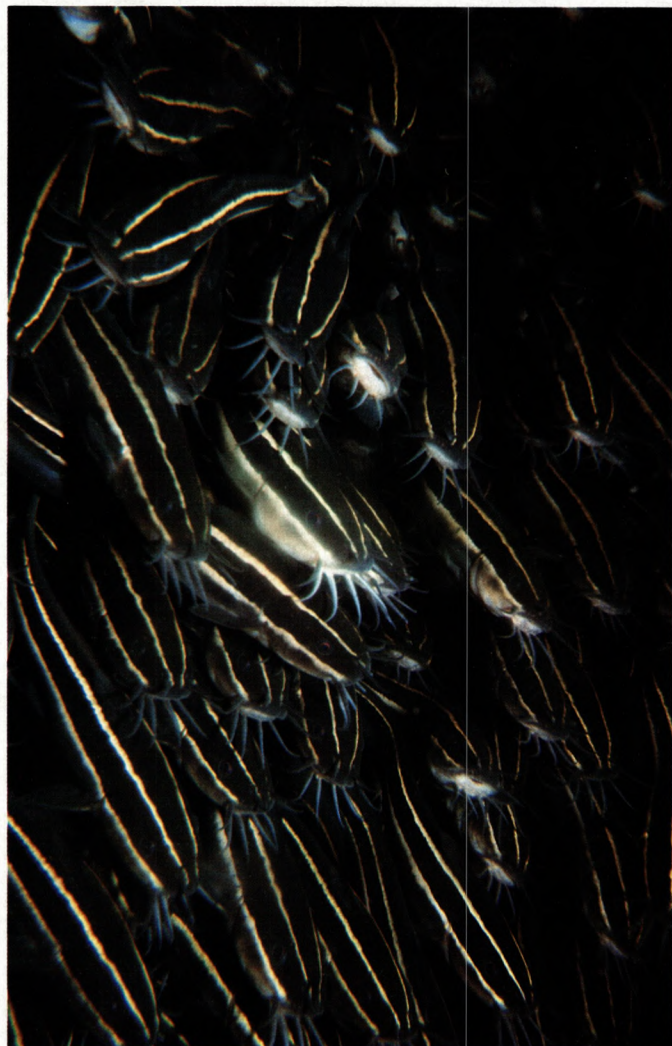
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Many hundreds of striped catfish form schools or "pods" that move over sand or mud bottoms in search of food, which they locate using their sensory barbels or "whiskers". Photo taken at Halifax Park, Port Stephens, NSW with a Nikon F2 and 55mm micro lens in an Ikelite housing using electronic flash.

cat-like "whiskers" on the bottom jaw to help locate food hidden on sandy and muddy bottoms. The skin has no scales and is slimy to touch. The leading margins of the dorsal and pectoral fins have a double-edged serrated spine, and glands in the area produce a toxic mucous, which in combination can produce a very painful wound for the unwary fisherman or diver. These three spines are almost invisible because they are hidden by a thin membranous skin, and it is not until you pick one up or tread on one that you realise their great potential for inflicting pain.

Common first aid techniques include removal of any obvious pieces of spine, skin or mucous and immersion of the injured limb in hot water to help relieve the pain.

It's interesting what fish get up to sometimes. An unusual encounter I read about occurred in a rock pool where a small school of juvenile striped catfish left stranded by the tide formed

a circular mass with their heads pointing outwards, giving the impression of a large sea anemone. An explanation may be that they were trying to look as unfish-like as possible to one of their main predators, the estuarine black shag or cormorant. This sea bird, with its great underwater swimming and fish-stalking abilities, could quickly make a meal of the trapped fish.

There are about 1000 species of catfish in rivers, estuaries and harbours of the world, however, the striped catfish is limited in its range to the central Indo-Pacific. It is found in rivers, bays and estuaries in all Australian states, except Victoria, South Australia and Tasmania.

A diver of 20 years and an underwater photographer since 1974, Robert Berthold collects and catalogues fish on a casual basis for scientific research.



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WRECKS

Treasure Ships or Drowned Museums?

Discovering a new wreck provides most divers with the challenge of a treasure hunt and the thrill of an excursion into the past.

Text by Mark Warwick Photographs by Patrick Baker



Don Francisco was renamed James Matthews when she was sold as a slave ship and reregistered as a general trader.

Disaster strikes a ship quickly. A minimal error can cause a collision. A careless action can result in a fire or explosion. Fatigue or human failure can see the bottom ripped out of a ship in seconds. A typhoon or hurricane can drive a ship so far up a beach that it's high and dry when the weather improves. Most

divers would agree that wrecks are sad and thought-provoking sights; dismal monuments to human failures and lost battles with the elements.

The possibility of salvaging sunken treasure has excited man's imagination since the first ocean-going ships. The chances of actually find-

ing one in Australian waters are remote, but Dutch treasure ships have been found in Western Australian waters.

Most underwater sites are discovered by divers and others with little or no knowledge of archaeology. The experts enter later, drawn by news of the discoveries. Looking for treas-

ure is no way of ensuring yourself a financial independence in your old age. Some have been particularly fortunate, but the majority of seekers have come financial croppers fitting out expeditions to search for treasure.

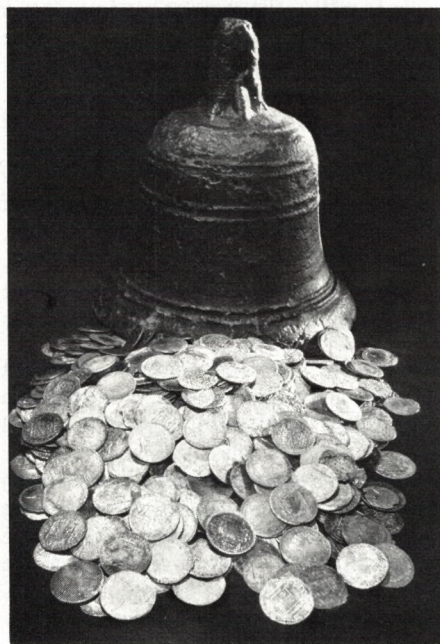
All relevant information regarding a wreck must be obtained and sifted as the vessel, no matter how old, still belongs to somebody. Hours of painstaking research through old history books, newspapers, maps and local historical documents are required. A wreck is a challenge that combines a treasure hunt with an intriguing excursion into history.

The most important aspect of underwater salvage is the historical interest and value of artefacts on the site. No wreck should be torn apart. First you should seek out marine archaeologists and from there the real work begins.

Since the development of the aqualung, divers have undertaken a great deal of work on early steamships, battleships and even World War II aircraft. While such enterprises are interesting, some don't consider them to be archaeology.

As an academic discipline, archaeology interprets the past on the basis of surviving objects. It becomes redundant when records of contemporary objects can tell us more about the culture of the time than we can learn by digging up a few relics.

Most divers remember reading childrens books with the customary wreck tale; an upside-down ship with an accessible funnel and a standard sea monster guarding the gold. Hollywood has established the concept of ancient shipwrecks remaining intact. They sit on the ocean floor in one piece, skeleton at the wheel and the hold full of chests of silver and gold coins. The first visit to an old wreck is apt to be disappointing.



The bells and a mass of coins were salvaged from the *Rapid* and are now on display in the museum.



A chess set was the finest find from the wreck of the *James Matthews*.

In fact, any timber ship that has been under saltwater for a considerable period will have been almost completely destroyed. Substantial remains of wooden structures are much less likely to survive if the vessel breaks up on the surface, as heavy objects drop to the seafloor.

You would have to penetrate the vessel within the first few weeks to find any trace of a body. The flesh is eaten in a matter of days, not only by fish and crustaceans, but by such unsuspected creatures as starfish, which are voracious individuals. The bones will then be efficiently consumed, mainly by worms and bacteria. Usually, all that remains of wooden wrecks are ballast stones, cannon, anchors, and the non-perishable cargo. Saltwater corrosion will have attacked the more susceptible metals. In most cases, anything left over will be buried under sand, which is how a diver can swim over a wreck without knowing it's there.

A ship is an organised assembly. When the ship is holded or capsized, this organisation breaks down. She may sink to the sea bed intact or arrive there in pieces. Either way, over the centuries, waves, currents and marine creatures break up and scatter the remains of the vessel. Archaeologists are ultimately interested not in the wrecks, but in the ships they once were. Their principle task is untangling such disorganisation.

When a ship sinks, it becomes a time capsule. The wreck contents are all of contemporary use. The equipment and cargo, including possessions of crew and passengers, form one of the most valuable pegs for archaeological chronology and the study of ancient trade.

There are many stories of exhumed Spanish gold, where the heirs and assignees of conquistadores and kings have turned up with genealogical claims to the loot. The governments of the countries whose territorial waters have been plumbed have presented enforceable tax liens. Divers who returned with pieces-of-

eight found their own governments removed most of it in taxes, and many treasure hunters have wished they had left the accursed bootie where they found it.

If you don't have the salvage rights the best thing to do is look but don't touch. Many wrecks may still lie around Australia's coastline. Research, perseverance, and the use of modern diving and electronic equipment are the keys to successful wreck hunting. The discovery of an anchor, a gun or some fragments of pottery could indicate the presence of a wreck.

A diver needs trained eyes to find the signs; a slight anomaly of the bottom contour, an oddly shaped rock, or the graceful curve of a buried bell. Do not act without written agreement or without knowledge of the local law, or your time will be devoted to the inevitable litigation.

When the wreck of the *James Matthews* was found in July 1973 by a party of divers in Cockburn Sound (about 100 metres from Woodman's Point, south of Fremantle), it had been buried for 132 years in a sand basin surrounded by seagrass. The highest section of the ship consisted of mounds of slates and bundles of large iron rods, a paying ballast destined for colonial Western Australian blacksmiths.

Initial examination of the timbers by archaeologists from the Western Australian Museum showed the hull was of a structure used in slave ships. During several years of excavation on the site, some 3500 roofing slates were raised intact. A little more than half of these were used to restore the historic Strawberry Hill farm complex at Albany, built at about the time the *James Matthews* sank.

Other building materials raised from the wreck included glass window panes, door hinges, carpenter's tools and nails. A number of irons, stoneware jars, bottles of wine, glass and china ware, clay pipes and cooking pots ►

WRECKS: TREASURE SHIPS OR DROWNED MUSEUMS? *continued*

were also found, along with an almost complete chess set. Equipment from the ship included pulley blocks, sheaves, rope, and a host of other items. Once the artefacts had been raised sand was pumped back over the hull timbers to protect the site.

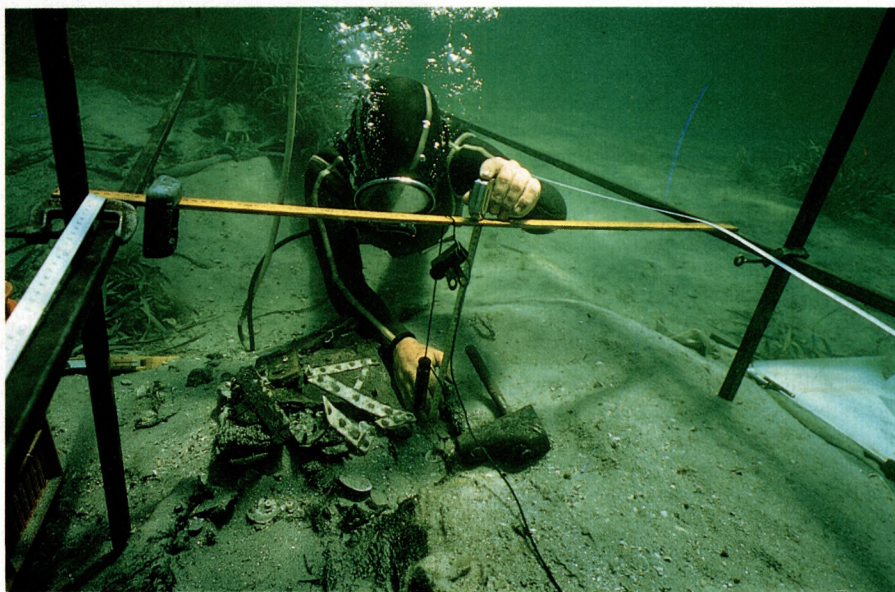
The first clue to the ship's identity came from an entry in Lloyds Shipping Register, dated 1838. The word "prize" indicated that the ship had been seized, and was either a slaver or a pirate vessel. Further research in Admiralty Court files unfolded the story of the 24-metre ship, the *James Matthews*, built in France.

The first owner was a Frenchman, Gabriel Giron, who sold her in 1836 to a Portuguese slave ship owner, who renamed her the *Don Francisco*. Don Francisco Felis da Souza was a close friend of the King of Dahomey, and a one time governor of the Portuguese fort at Whydah in the Bight of Benin. He owned a fleet of ships built for the slave trade with shallow drafts and fine lines for speed.

Slave traders from Europe and America tapped the human resources of Africa for about 400 years. Christopher Columbus did not realise the damage he was doing to Africa by discovering the Americas.

The slave trade rapidly transformed Africans into one of the most humiliated races in human history. The black rulers waged war on each other to capture slaves they could sell or exchange with traders for guns, rum, cloth and other items. In all, as many as 10 million Africans are believed to have been carried to other parts of the world by the slave merchants.

Aboard ship the slave captives lived for weeks in filth and horror. Many were chained hand and foot and packed together in the holds so



A physical survey is undertaken of the waterline markings and rudder fittings of the *James Matthews*.

tightly they could hardly move. Thousands died as a result of brutal treatment and disease. The rising European demand for sugar helped create fierce competition for slaves. About 65 percent of slaves were brought to Brazil, Cuba, Jamaica, Saint Domingue (Haiti) and other sugar colonies.

Crammed full of slaves, the *Don Francisco* slid out of the African port at Whydah in 1837 on a voyage to Havana under the command of Captain Antonio Pieria Lisboa. Near the island of Dominica on April 25, 1837, she was pursued by a patrolling British warship, the brigantine *Griffon* under Commander John d'Urban.

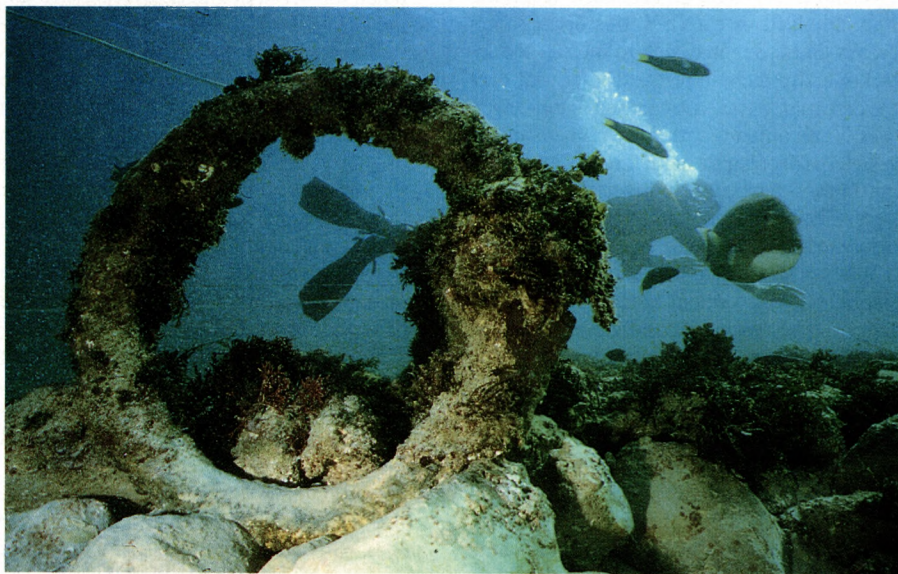
After a chase lasting seven hours, the *Don Francisco* was boarded and seized as a prize.

Further research by Graeme Henderson, the archaeologist in charge, showed the *Don Francisco* was taken straight to Dominica instead of making the lengthy voyage back to Sierra Leone for adjudication. Commander d'Urban was concerned because the captured ship was close to sinking and the slaves might drown. He was also worried that he would lose the prize money.

In Dominica, the ship was condemned as a slave trader by the British and Portuguese Mixed Commission Court on November 21, 1837 and was lucky to have survived intact after capture. In 1837, a British Parliamentary Bill required slave ships should be broken up entirely, and sold as separate parts immediately after condemnation. Had the adjudication of the *Don Francisco* taken place in Sierra Leone, rather than Dominica, she would never have sailed again. Instead, she was sold and re-registered under the new name of *James Matthews* and became a general trader.

On April 7, 1841, the *James Matthews* left England and set sail for Western Australia via Cape Town. Henry and Robert de Burgh had persuaded their mother to finance the purchase of goods and equipment needed for farming in Australia. They came to a financial agreement with Frederic Leith and others who owned the *James Matthews* for the cargo's shipment. On the night of July 22, 1841 the anchors gave way, and after drifting, the brig's keel struck bottom. Later, the ship turned over.

The 15 crew and four passengers, including the de Burgh brothers, were taken safely ashore



A diver fins past the ring of one of the three ship's anchors atop the granite ballast.

at Woodman's Point. Some of the brothers' descendants still live in the Perth suburb of Como.

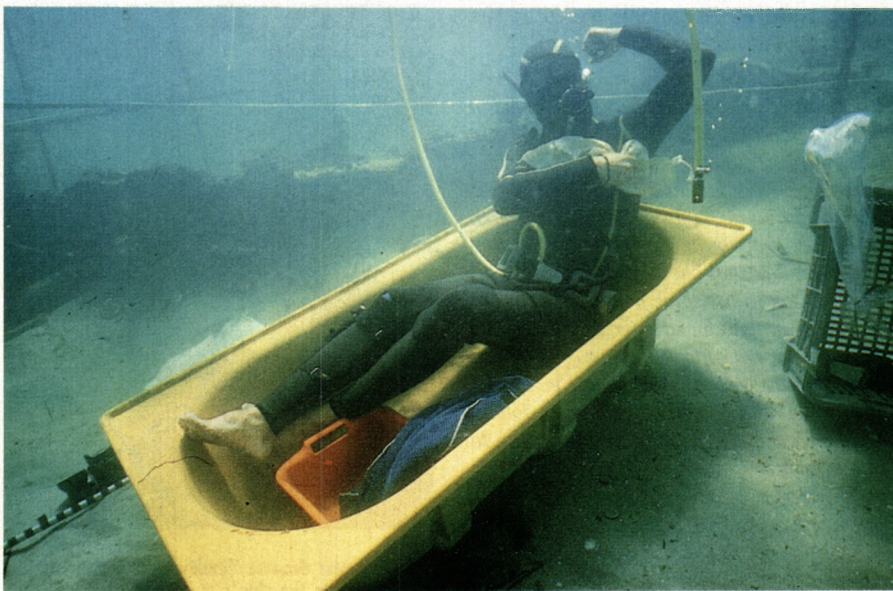
The wreck of an American East Indiaman was discovered accidentally by four divers, Glynn Dromey, Larry Paterson and Frank and Barry Paxman, in the region of Point Cloates in 1978. The wreckage lay six metres of water on the leeward side of Ningaloo Reef. Given its position, the distressed ship may have been looking for a sheltered spot suitable for beaching. Before sinking the vessel had burned to the waterline. Archaeologists found charred wood, glass and globules of once molten lead.

When it was first discovered, the ship rested on its port side half buried in the sand. Initial inspection of the wreckage revealed three small cannons, as well as anchors, an iron stove and the base of a capstan. Among the more recognizable material about the bow section was the ship's bell.

Even more interesting was a collection of silver coins scattered on the hull forward of the stern. The Spanish coins first attracted the four divers who recovered 6000 of them. Spanish currency was used by all major trading nations.

The Western Australian Museum, again under the direction of Graeme Henderson, organized several excavations and found a variety of items that could help to establish the ship's identity. These included a number of the crew's personal possessions, more than 19,000 coins from different countries, coal which had fallen amongst the ballast, and various copper fittings. Examination of the timbers showed the vessel was about 30 metres in length.

The substantial quantity of coins suggested the ship was lost on an outward voyage from



A bathtub filled with sand and water was used to safely raise salvaged rope.

Europe or America. Had it been homeward bound, such a sum of money would have been spent on cargo. This theory was confirmed by the large amount of ballast carried (some of the stones have been found on abandoned Aboriginal campsites where they had been used for grinding).

Trade with the east, especially in pepper, was such a lucrative business that outward bound East Indiamen often carried no cargo. They carried ballast to keep the ship stable, then filled the holds and returned home.

Among other things, six US copper one-cent pieces were found, two bearing the date 1805.

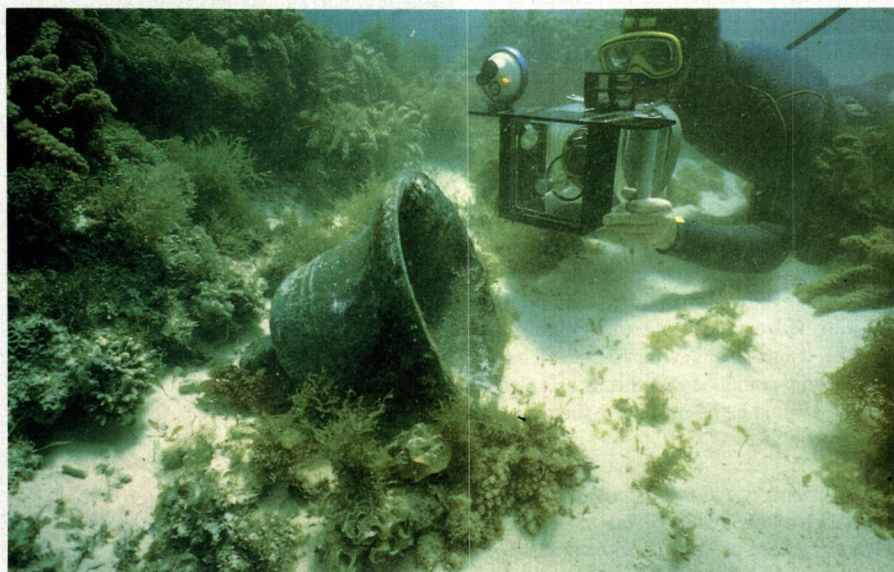
A clue to the port of origin was burned into the lid of a salt beef barrel. The words MESS BEEF BOSTON MASS appeared below the letters E & A W . . . STERS (possibly WORCESTERS), possibly the firm which supplied the meat.

Another indication of the ship's origin was the insignia of J Davis on a number of copper dovetail fittings and gudgeons. Jonathan Davis of Bath in Maine was a merchant and ship's chandler, who built 22 ships between 1785 and 1819. His son, Jonathan Davis Jr, lived in Boston and would have been familiar with East India trade.

At the beginning of the 19th Century, East Indiamen were generally well armed vessels in order to run blockades mounted by warships and privateers, and to defend themselves against pirates. Trading with the far east was a matter of adventure and some danger.

The regular route for outward bound China traders after rounding the South African Cape was to sail towards Australia. Having used the Western Australian coast to establish longitude, they sailed north to the straits east of Java, and from there to China.

Graeme Henderson flew to America and found references to the wreck of the *Rapid* in a newspaper in the Boston Public Library. She was reported to have gone down off the Western Australian coast. The crew escaped to Batavia before making their way back to Philadelphia. She had \$280,000 in coin when she sank. This took the trail to the Massachusetts Historical Society for a search of the family papers of the *Rapid's* skipper, Captain Henry Dorr.



A unidentified ship's bell recovered from the *Rapid* may have been cast by the American patriot Paul Revere in his Boston foundry.

Extracts from a family bible owned by Mrs Francis Hayward read:

"1811. July 27. Brother Henry Dorr arrived in Philadelphia in the schooner, General Green, III days from Batavia — having been shipwrecked on New Holland in the ship Rapid from Boston on the night of 7th January last. On the 8th, finding the efforts to get the ship off in vain, and that she was going to pieces, the crew took to her three boats — set fire to the ship and abandoned everything that the wreck might not appear above water and present future attempts to save the specie, which amounted to 280,000 Spanish dollars with which she was destined from Boston to Canton."

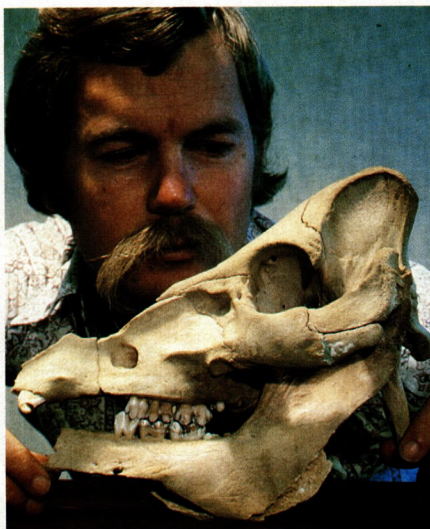
For more details of the *Rapid*, Henderson then went to Washington to examine the Customhouse Register of 1807. It showed the *Rapid* was registered in Boston and built at Braintree in 1807. At 367 tonnes, the *Rapid* was about 34 metres long with two decks, three masts, a square stern, a figurehead and no galleries. Further research proved J Davis to be a copper founder in Boston.

The bell may have even originated in the foundry of the celebrated American patriot Paul Revere. After the war, Revere returned to his silversmith trade in Boston, as well as casting cannon and bells in bronze. Many of his bells are still used in New England.

At one time, sportdivers were removing important ancient material as souvenirs or for profit. In many parts of the world, much of maritime archaeological value has been lost forever by ignorant, greedy or thoughtless pillaging. In Australia, the bad old days when anyone could descend and plunder have gone. Today, archaeologists have come to see sportdivers not as a threat, but as a potential reservoir of labour for research. In their turn, many divers realise a responsibly conducted investigation could be more interesting and challenging than simple looting.

The most important legal protection for underwater sites is public ownership of all historic material on the seabed. There should be efficient procedures to allow excavation by adequately equipped and experienced teams, and for keeping a watch on their progress.

Equally, the law should permit non-destructive inspection of sites by responsible groups in order to maintain interest and allow continuous assessments of their condition. This is particularly important for club divers; the likely discoverers of wreck sites. Their access to and interest in such sites deserves respect. There will always be sites where material is lying around loose on the seabed, presenting a temp-



Archaeologist Graeme Henderson examines the pig skull found in the ship's stores.

tation to diving visitors, or where natural erosion threatens the remains.

It is not enough to record and preserve objects recovered from an underwater excavation, then lock them out of sight in a museum basement. Some objects will always interest society at large, helping us to appreciate how our ancestors lived.

Conserving, storing and displaying artefacts is not the end of the story. Equally important are the site plans and records. These should show, as far as possible, the context of all objects recovered. Once he has processed and studied this information and drawn conclusions from it, an archaeologist's duty is to make his findings available to everyone interested in the work. The Western Australian Maritime Museum and its staff have certainly lived up to this expectation.

If you began to think I believe searching for treasure as a professional task is a fairly insecure occupation, you would be dead right. Legends of undersea treasure are 95 percent hoaxes or swindles. The only wealth uncovered is passed from the investor to the promoter. The get-rich-quick aberration is never more successfully exploited than by treasure promoters with faded maps of sunken galleons. However, if anyone has certain proof of a handy treasure ship crammed with ducats and pieces-of-eight, I would be happy to give them a hand in recovering it.

Mark Warwick is a diver and author of numerous articles on photography, four-wheel driving and natural history. Many of his marine science articles have been produced in conjunction with Patrick Baker of the Western Australian Maritime Museum in Fremantle.



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Combine a week of exploring the islands with discovering new dive sites from the *MV Coriolis* and you too will be "very happy in Vanuatu".

Text by Cassie Welsh



Cassie Welsh

Hapi Tumas Blong Vanuatu

It was an offer I couldn't refuse. Escape to Vanuatu for a week, cruise along the islands each moonlit night, dive world-famous sites and many new ones each day, then go ashore of an afternoon to explore the islands and enjoy a relaxing swim.

It was work, but 16 of us agreed to go on a trial run of a new live-aboard — the *MV Coriolis*. Armed with well-stocked dive bags, underwater, land and video cameras, a small amount of clothing, a few dollars in Vatu and a sufficient amount of curiosity, we were prepared for the task set before us. No dive site would go unnoticed and no meal untouched.

When we first saw our vessel, she was sitting in Port Vila harbour, a massive sight just for our group. The *Coriolis* is 37.5 metres long and accommodates 16 guests and 12 crew. A former French research ship, she's well-equipped for long voyages and capable of an 8500-mile cruising capacity. The two Zodiac dive tenders were there to meet us and ferry over our massive pile of baggage and people.

Once onboard, we escaped the humid night air to the air-conditioned Maindeck Bar and



sorted out our cabins and belongings. All dive gear to bins in the dive centre, and all other belongings to the cabins, where ample storage is provided. After one or two glasses of rum punch and introductions, we headed to our rooms to unpack and get a good night's sleep while we cruised out of Vila.

"Tomorrow morning, we dive bright and early," said our divemasters, Bob and Judy. The adventure begins . . .

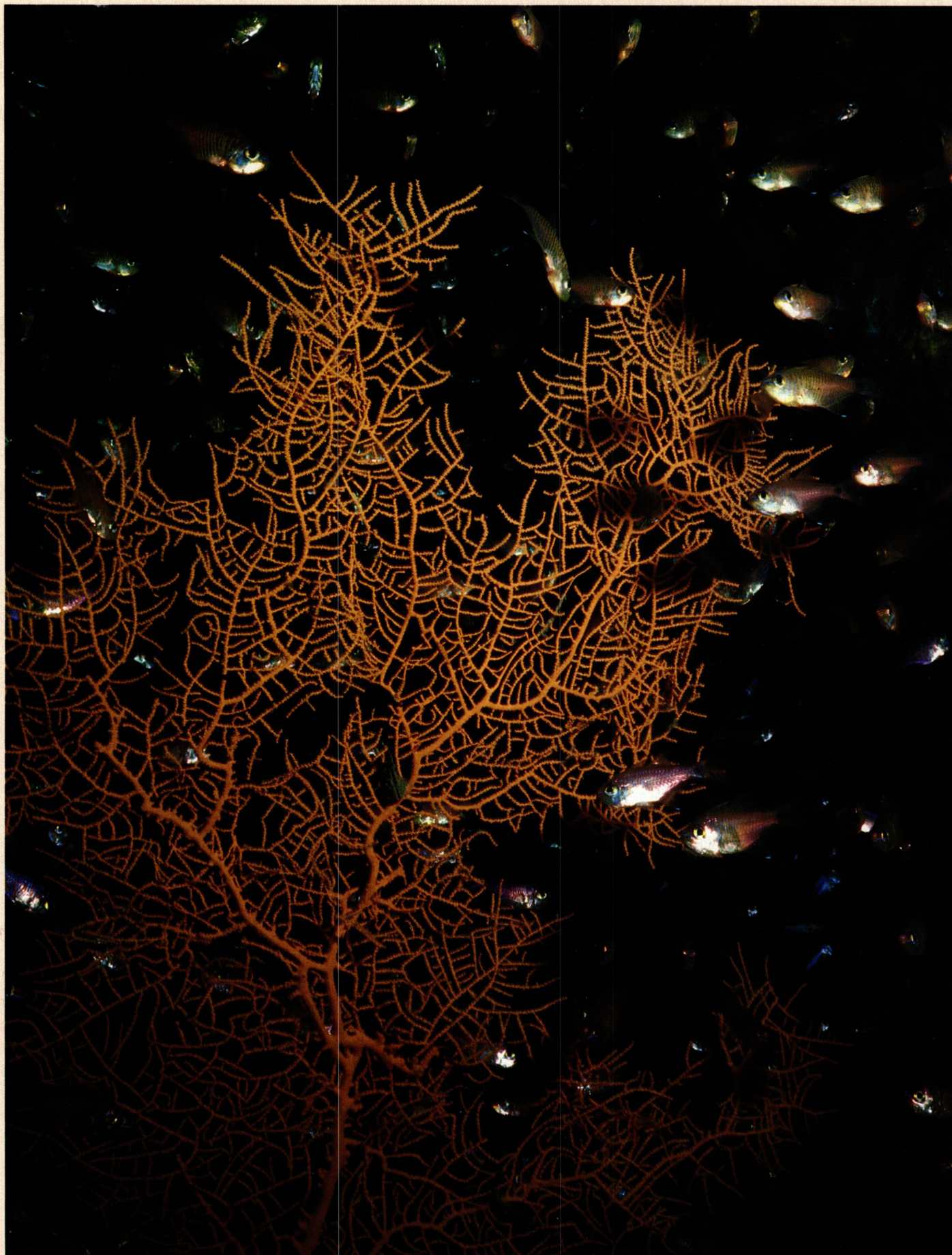
The Diving

Vanuatu is a country of some 80 islands in the shape of a "Y" and approximately 450 miles long. The waters surrounding these verdant tropical islands are warm and clear with many unspoiled reefs, great caves and swimthroughs, sheer vertical dropoffs and wrecks of the Pacific WWII battles.

While the colours seemed muted and the corals predominantly hard on one dive, two or three days later we encountered brilliant gorgonians and soft corals teeming with all sizes and varieties of fish. On the drift and wall dives, reef sharks, hammerheads, barracudas and many other pelagics cruised in and around us. Turtles and rays are not uncommon either. And, of course, you have the wrecks of the

Above: Divers were only a short ride away from each dive site and the islands in the Zodiac dive tenders.

Opposite: In an unnamed coral reef off Pentecost Island, the swimthroughs and crevices were lined with yellow, orange and red gorgonian teeming with fish life.



Clint Hampall/Odyssey Graphics

HAPI TUMAS BLONG VANUATU *continued*

President Coolidge, Million Dollar Point and other sites.

Bob Bowden and Judy Beaty are the dive-masters on the *Coriolis* and responsible for the dive itinerary. Both have considerable experience in this area, having run successful live-aboards and land-based resorts in the Cayman Islands and Fiji. Vanuatu is a new experience for them, so they are looking for new dive sites every chance they get. They talk to the locals, called ni-Vanuatus or ni-Vans, about their surrounding waters and look for the breaking of a reef or an interesting rock outcrop. Their list of sites is growing.

In the case of the *President Coolidge*, they set up a meeting with Allan Power, "caretaker" of the wreck, when they first arrived on Santo and discussed their plans to run dives there. He granted his approval. Power's map of the wreck is used for briefings on the boat, and Bob and Judy guide their divers along the submerged giant with experience from their dives with him.

Guests on the boat can choose to dive the established dive sites, which come with a briefing, or explore the new areas that they just happen to find along the way. We chose a mixture of both and were excited many times that we just might be the first divers ever to see that reef or wall. Virgin dive sites, uncharted territories...

Up early the first morning, and our boat heads out to a dive site called Cook's Reef. Bob briefs us that this is a drift dive, just go with the current, and our boat captain will follow our bubbles. We drop in and immediately begin gliding over coral bommies and into a gulley or two. The colour of the hard coral here is very muted, almost monochromatic with pastel shades of dusty rose and faded blues and greens. I drift over this "coral countryside" like a lazy glider, dropping in for a closer look at some Christmas tree worms or clownfish. Some areas are a bit sheltered, so you can drift in and out of the current, but mostly I enjoy this effortless dive at a maximum of 18 metres. At the end of 50 minutes, Leon, Jim and I cruise up to 4 metres for a "safety drift".

Back on the *Coriolis*, we head north to Maskelyne Island for an afternoon dive. A coral



Blue Holes, a freshwater pool that's a short drive from Luganville, is an excellent Santo side trip for photos and a swim.

Cassie Welch

bommie close to the surface with a dropoff in excess of 70 metres and good current we're told. Leon and I agree to 16 to 18 metres and fall into warm, 28 degrees Celsius water. The corals and sponges on the top of the bommie intrigue us, but we move on, saving that for a safety stop later.

Over the side and the current is moving. Schools of blue tang, yellowtail and trevally swirl around us, and we can see the reef sharks nearby. At one point, we just stop and watch the passing parade. The sharks are curious, but keep darting away from us. Down and over the wall, we move slowly by lionfish and several varieties of butterflyfish. I try to catalogue each pattern in my mind to identify them later (but don't). Visibility varies because of the current, but I feel the sacrifice of a little viz in exchange for heaps of fish is a fair deal.

If it's Monday, it must be *President Coolidge* day, and I'm excited because this is my first time diving this wreck. We leave early that morning because the dives will be deep and we have a short ride to reach the site. In the water and down to the deck, which is about 18 metres, then over the side. Nothing had really prepared me for the sheer size of this ship — it's several

stories high, and I can't begin to fit it all in my field of vision. We move down the deck, and I realise my dreams of seeing the "Lady" won't be possible on this dive. Not enough time, and we're moving too slowly.

We come back through the promenade deck, which is littered with guns, ammunition and helmets. I lift a machine-gun just for the thrill of it, and clouds of silt rise around me. On our way back, we peek into the holds to see jeeps and other machinery, then occasionally turn around to put it all in perspective.

On my second dive, Chris and I agree to do some posing for Wayne, who's shooting a video of the trip. No Lady this time either, but we do manage a careful inspection of the chain locker where a stack of surplus portholes lie. Careful finning to keep silt to a minimum as we all three manoeuvre in this tight space. Then, out on the deck and the side of the ship for close-ups of lionfish, which are in abundance. On the way up to the coral gardens, Calvin, the giant cod makes an appearance. What a sight! He's about the size of a small motorcar, and he has so many cleaner wrasse around his mouth that it looks like he has a vibrating moustache.



Chris Ousted



Thirty to 40 metres deep, the promenade deck of the *President Coolidge* is littered with guns, ammunition and helmets.



HAPI TUMAS BLONG VANUATU *continued*

Once in the coral gardens, I could stay until I run out of air, and almost do. Here, Allan Power has constructed a series of coral gardens for safety stops that have attracted hundreds and hundreds of fish in just a few years. I've never seen so many numbers and varieties of clownfish in one space. What a wonderful man he is to have created such a place of beauty and enjoyment. I left the *Coolidge* vowing to do this trip again and do more dives here.

That night, we cruised to Hog Harbour, further north of where we had previously anchored in Santo. On first sight the next morning, we see rugged peaks rising out of the water on one side of the boat and beautiful sandy beaches on the other. We decide to dive the walls of the peaks, a virgin dive spot. John, our boat captain drops a few of us off at the wall, and it is indeed a sheer, vertical cliff — very barren at 30 metres except for the occasional reef shark. Leon, Sue and I move up to 12 metres and see more fish and some soft coral, but, it's not until we round the bend of the wall that this dive gets interesting. There, in a sheltered cove, we find small caves and plenty of marine life. We just started the dive on the wrong side. Next time . . .

We return near this site that evening in a light rain, and six of us enter the water. Only minutes later, I hear squealing and look up to see Bob hitching a ride with a green turtle. We weren't so lucky with other critters and had to be content waking up starfish, sea slugs, sea cucumbers and the odd fish or two for the next hour. The water was so warm and comfortable that I didn't want to get out.

Overnight, we moved east to Pentecost Island, where we would dive a "new" wreck, half a Hellcat that was just discovered last November. Based on stories from some of the ni-Vans, a search party found the wreck only 12 metres deep and within sight of shore. Six of us rise early the next morning and rush through breakfast to be on the first boat out.

A hundred or so metres from the *Coriolis*, dolphins join us, jumping playfully at the bow. I always view dolphins as a sign of good things to come. Jim drops over to troll and sight the wreck, but the visibility isn't great (3-4 metres). Once down, it's amazing to see half a plane



Cassie Walsh

Young men from the nearby islands would often approach our ship in outriggers laden with fresh seafood, fruits and vegetables for sale. We called them our floating green grocers.

(from the cockpit forward) upright, controls still intact. Featherstars and sponges have taken up residence on the wreckage, and several species of fish from the nearby bommies swim round curiously watching us. We are only the third or fourth lot of divers they've probably ever seen. The bommies are excellent macro material and quite colourful in contrast to the silty, rusting wreck.

We found out later that we were lucky to have dived the wreck in the morning because conditions changed during the day and others couldn't locate it. Several of us did an afternoon dive at a nearby coral reef noted by Bob for its wide crevices and brilliant red, yellow and orange gorgonians, perfect framing material for wide-angle shots. We weren't disappointed as we finned in and around the large fans. I wandered off to explore a small, dark cave and thought I'd made a dangerous mistake when silt stirred up from the back clouded my vision. Not quick enough to grab hold, I watched a large, green turtle, probably awakened from a nap, zoom overhead and disappear. I spent the rest of this 16-metre dive observing triggerfish, angels and coral trout from a respectable distance.

Conditions continued to deteriorate as we headed south that night to Tongoa. (It was only when we returned to the mainland that we heard about the cyclone, two earthquakes and volcano erupting that week.) The next morning, I sat out the first dive and waited until the boat moved to a quieter spot near a small rock peak. By now, it was raining and a serious storm brewing when we entered the water and left it all behind.

Down below were masses of plate coral carpeting the seafloor. All along the wall, Bob would stop to point out something to the nearest one of us. Such an incredible range of shapes and textures combined with the featherstars, coral whips, anemones and small fishes. A large cuttlefish didn't escape our attention nor our attempts to corner it for a moment. It was our last dive, and we weren't ready to surface yet.

The Islands

A dive holiday on the *Coriolis* combines the functionality of a dive live-aboard with the comfort and some of the amenities of a cruise liner. One of my favourite amenities is the side trips to the islands in between dives. It gives you the



opportunity to absorb a bit of the culture, take in the local sights and get your "land legs" back. Since most of the crew on the boat are ni-Vans, some (like John, Tom and Carlos) were our hosts on the islands and a great source of information about customs and traditions.

Our first venture ashore was on Santo and turned into quite an adventure. After an early dive on the *Coolidge*, we headed into Luganville, making the Hotel Santo our land-based headquarters. Here the beer is cold and the staff quite used to dealing with divers. We hastily broke up into smaller groups, rounded up some "taxis" and headed out to Blue Holes for an afternoon swim. Now, I must explain here that our taxis were small trucks, we piled 6 or 7 people into the back, and bounced along dusty roads past copra plantations for 45 minutes or so — and, it was well worth the dirt and sore bum.

When our driver stopped, there was a large freshwater pond in front of us, shaded by huge trees that also provided jumping-off points for the 20 or 30 boys and young men there that afternoon. The water was so clear you could see the bottom, some 15 to 18 metres down, and so cool and refreshing. With our bright coloured swimmers and snorkelling gear, we were a curious sight to the polite ni-Vans, and we all enjoyed a fun afternoon together. This side trip is highly recommended for the ride and swim, but don't forget your underwater camera (like we did).

The next day, several of us explored another side of Santo by going into Hog Harbour with Judy to buy some fruit. In this small village, the ni-Vans came out of their small wooden and thatched houses to welcome us, ever so shyly. It was very quiet because of a national holiday,



Chris Quastel

Brilliantly coloured crinoids and soft corals covered the bommies around Tongoa.

Chief's Day, but we managed to buy some paw paw and coconuts and shoot photos.

On our return back to the boat, we made a short detour to the next beach around, the famous Champagne Beach. Postcard-picturesque, the beach has snow-white sand, crystal clear turquoise water and a small village market area, built specifically for the large cruise liners like the *Fairstar*.

The markets were empty the day we visited the beach, but we had our markets come to us later. Young men approached our boat on a couple of occasions in outriggers laden with fruit, vegetables and seafood. One night, we feasted on freshwater prawns and fresh salads with watercress from our floating green grocers.

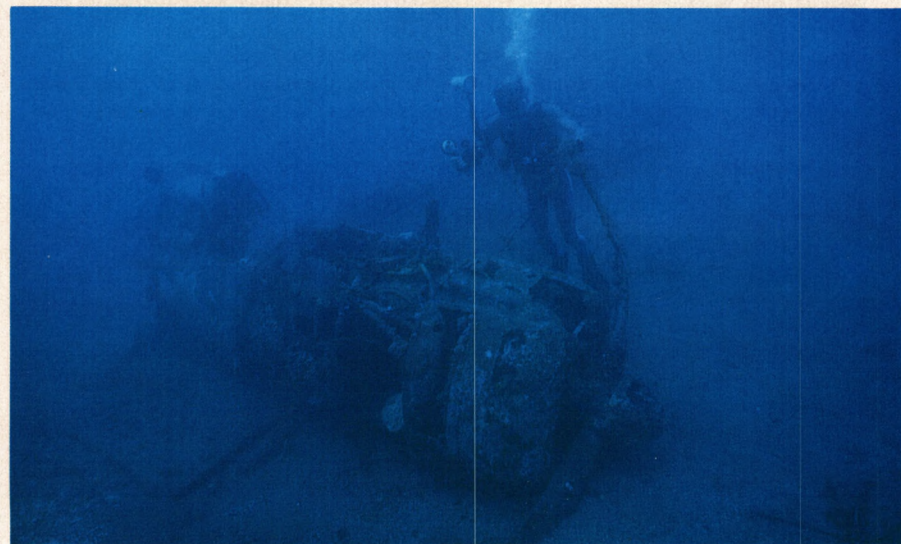
Our final land excursion took us to Pentecost Island, when we went ashore to see the famous towers of the land divers. Land diving traditionally occurs in April and May when the men prove their courage by jumping from tall bamboo towers with vines wrapped around their ankles, women proclaim their loyalty and support, and everyone hopes for a good yam harvest. The towers weren't under construction for this year's event, but the locals pointed in the general direction through a thick jungle to where the festivities would take place.

We did spend an interesting couple of hours with the local schoolchildren who led us on tours of their neighbourhoods and willingly posed for photos and the video. No one seemed to mind that we had little fluency in Bislama, the Pidgin of Vanuatu. They were amazed with motordrives, playbacks of the video, and seeing each other through the camera lens. Peter went through five rolls of film letting them shoot school photos of each other. And, I made a friend for life with a little girl who didn't leave my side.

Layout of the Boat

Inside is the main dining area and the Main-deck Bar, all airconditioned. A video and TV monitor sit in the dining area. Besides soft drinks and alcoholic beverages, the bar also houses the CD and an eclectic collection, from the latest hit albums to Johnny Cash's greatest hits. The tables in the bar also doubled as camera preparation areas in the afternoons between dives.

For lounging and sunbathing, there are two main areas on the boat and plenty of room for privacy or socialising. The upper sundeck is ►



Peter Allen/Aquaphoto

Standing upright and with the controls still intact, this newly discovered Hellcat bomber off Pentecost Island is only 12 metres deep and surrounded by colourful coral bommies.

HAPI TUMAS BLONG VANUATU *continued*

Steve Madaway



The rear sundeck was a central meeting place after dives for snacks and socialising.

open and fitted out with reclining chaise lounges. The downstairs deck is partially covered and has tables and chairs. This is the central meeting place after a dive because the snacks are served here, as well as the occasional buffet lunch.

The equipment set up on the boat is excellent. Tanks line the benches in the dive centre, and you stow all your gear in the bins underneath. No sooner do you come in from one dive than one of the crew is unbuckling your used tank and strapping on a new one. Care is even taken to reposition or hook up your octopus just like you left it.

Cameras are rinsed on a large table in the centre, which has a sink at either end. Bob and Judy are also looking to expand the camera preparation area because they both have a good deal of interest and experience in underwater

photography. And, there is a never-ending supply of large towels in the dive centre for cameras, sunbathing or drying off after a quick shower outside.

Like the brochure says, all facilities are on-board, there is no need to land base. A week or two on the *Coriolis* is certainly the best way to see and dive Vanuatu without flying from island to island. When you can combine the proven dive sites with new, uncharted territories while cruising among the islands in comfort, you've packaged the style of holiday that makes me "hapi tumas blong Vanuatu" and longing for a return trip.

Cassie Welsh and the other guests on this trip flew to Vanuatu courtesy of Air Caledonie and cruised the islands courtesy of MV Coriolis and Dive Travel Australia.



TRAVEL INFORMATION

How To Get There — Air Caledonie, Air Pacific and Air Vanuatu provide regular service to Port Vila; check with the individual airlines for times. The flight is approximately 3½ hours. Guests are met at the airport by *Coriolis* staff, transferred to the dock in Port Vila and ferried to the boat in one of the Zodiac dive tenders.

Airport Tax — 1000 Vatu (Vt) on departure.

Visas — Visas are not required for Australian, American and French citizens and citizens of most Commonwealth countries.

Currency — Vatu (Vt). Major credit cards, travellers cheques and Australian dollars are accepted in Port Vila and some establishments in Santo.

Language — English, French and Bislama (Vanuatu's Pidgin).

Health Precautions — No vaccinations are required, but a course of anti-malarial tablets should be started prior to departure.

Climate — Temperatures average 28 degrees Celsius in summer (November to March) and 24 degrees in winter (May to October). Lycra suits and 3mm wetsuits are recommended for diving.

Ship Statistics — The *MV Coriolis* is 37.5 metres in length and has a cruising capacity of 8500 miles travelling at a speed of 11.5 knots. There are two Bauer K14 compressors onboard, as well as two 6-metre Zodiac dive tenders with twin 40hp outboards each.

Power Supply — 380/220/110/24 volts power from two Baudoin generators.

Accommodation — One four-person cabin and six twin-shares. Cabins are fully air-conditioned and include ample storage and a basin. Toilets and showers are down the hall with no shortage of hot and cold water.

Meals and Drinks — Breakfast, morning tea, lunch, afternoon tea and dinner feature local seafood and fresh fruits and vegetables. Wine is served with lunch and dinner. Soft drinks, spirits, beer and wine can be purchased from the Maindeck Bar.

Film Processing — E6 processing available.

Dive Facilities — Tanks and weights are provided, with additional equipment for hire from Nautilus Scuba in Port Vila. The dive centre has individual bins for storage and washing facilities for cameras and other gear.

Dive Programme — The two divemasters onboard have a selection of dive sites for charters and new areas to "explore" for experienced divers. The programme is flexible to accommodate the experience and interests of the guests. It includes dives on the *President Coolidge*, *USS Tucker*, Million Dollar Point, *Star of Russia*, as well as night dives and snorkelling.

Land Tours — Tours can be arranged to such areas as Champagne Beach, Blue Holes and Pentecost Island. A spectacular sight is the land diving on Pentecost, which takes place annually during April and May. *Coriolis* has trips scheduled for 1991 to coincide with the event, but you must book early.

For Further Information — Contact your local travel agent or Dive Travel Australia, 1st Floor, 33 Alexandra Street, Hunters Hill, NSW 2110. Telephone (02) 879 7160, fax (02) 879 7161.



1990/91 AUSTRALIAN *DIVE* STORE *DIRECTORY*

The Official Dive Store Directory published
annually by **Scuba Diver**

MUCH OF THE WORLD'S BEST DIVING IS IN AUSTRALIA

... SO IS FAUI

Like the most spectacular Australian diving locations, FAUI is renowned for unparalleled excellence in diving instruction.

FAUI Instructors have a reputation as quality diving educators, second to none. Accept the ultimate challenge today — become a FAUI diving Instructor.

**For further information contact FAUI National,
PO Box 246, Tuart Hill WA 6060, Phone: (09) 344 7882.**



THE SCUBA DIVER AUSTRALIAN DIVE STORE DIRECTORY

The following directory is a listing of dive stores throughout Australia, compiled from a survey conducted by *Scuba Diver* magazine. *Scuba Diver* mailed a form to over 200 dive stores and only those stores that responded are included in this listing. All prices and information is correct at time of publication, and we accept no responsibility for incorrect or omitted information. To be included in next year's directory, send all pertinent information to the Editor of *Scuba Diver*.

AUSTRALIAN CAPITAL TERRITORY

Pro-Dive Canberra
9 Lonsdale Street,
Braddon ACT 2602
Telephone: (06) 247 4911
Fax: (06) 247 2636
Owner/Chief Instructor: Suzanne Frost
Certification: PADI/FAUI
Courses Offered: All courses to Divemaster and Instructor.
Full time, part time courses and equipment supplied.
Cost Per Course: Basic \$325; Advanced \$195.
Dive charter available, dive club and newsletter.
Services Available: Sales, service, travel, air, hire, etc.
Comments: Pro-Dive is a friendly, professional dive training facility offering all services with a smile!

NEW SOUTH WALES

Action Divers Tuncurry
Shop 4, 17 Manning Street,
Forster/Tuncurry NSW 2428
Telephone: (065) 55 4053
Owner: Denis Kemp.
Certification: PADI.

Courses Offered: All, up to Instructor level including shark diver specialty. Full time courses and equipment supplied.
Cost Per Course: Basic \$295; Advanced \$195.
Dive charter available, dive club and newsletter.
Services Available: Sales, equipment, service, travel etc.
Comments: Forster/Tuncurry and Seal Rocks offer the most diverse diving on the east coast. Seal Rocks has the famous grey nurse shark gutters.

Alan Jarrett's Divers World
29 Cherry Street, Ballina NSW 2478
Telephone: (066) 86 3985
Owner/Chief Instructor: Alan Jarrett.
Certification: FAUI.
Courses Offered: Open water.
Full time, part time courses and equipment supplied.
Cost Per Course: Basic \$395.
Dive charter available and newsletter.
Services Available: Retail sales, hire, service, overseas tours, Solomon Islands, Philippines, Barrier Reef, Moreton Island, local. Sea shells for collectors, jewellery, marine specimens.
Comments: Divers visiting the area are always welcome to join us for social river dives at no cost other than hire and air if needed.

Aqua Sports Scuba Centre
430 Hume Highway,
Yagoona NSW 2199
Telephone: (02) 708 2826
Owner/Chief Instructor: Glen Percy.
Certification: PADI.
Courses Offered: Advanced, deep, wreck, photo, equipment, night, rescue, Divemaster, Master Diver, assistant instructor.
Full time, part time courses and equipment supplied.
Cost Per Course: \$290; Advanced \$290.
Dive charter available, dive club and newsletter.
Services Available: Sales, service (all types regs), local tours, overseas tours, underwater photography, equipment sales and service.
Comments: Large stock range, underwater photography specialists, complete reg and gauge service and repair centre.

Aquatique
38 Worrigee Street,
Nowra NSW 2541
Telephone: (044) 21 8159
Owner/Chief Instructor: Arnold Aldous.
Certification: PADI.
Courses Offered: PADI Basic through to PADI Advanced.
Part time courses and equipment supplied.

Cost Per Course: Basic \$250; Advanced \$230.

Dive charter available.
Services Available: Sales, equipment service, tank testing.

Bounty Divers
PO Box 639, Norfolk Island 2899
Telephone: (6723) 2751
Fax: (6723) 3375

Owner/Chief Instructor: Karlene Christian/Jack Marges.
Certification: PADI/FAUI.

Courses Offered: Open water diver through to Divemaster and a range of specialty courses.
Full time, part time courses and equipment supplied.

Cost Per Course: Basic \$295; Advanced \$175.

Dive charter available, dive club and newsletter.

Services Available: Equipment sales at low tax free prices, diving holidays for individual and groups, learn to dive holidays.

Comments: We pride ourselves on our personal service and safety record. All dives are escorted by qualified divemasters. We can arrange packaged holidays.



Kev and Chris Deacon's

DIVE 2000

No. 2 Military Rd., Neutral Bay
2088 (Cnr. Merlin St.) Sydney.
Phone (02) 953 7783

- **SYDNEY'S LARGEST RANGE of Dive and Photo Gear at competitive prices**
- **U/W Photo gear for HIRE.**
- **AUSTRALIA'S LEADING Underwater Photo School**
- **PADI Training facility with Basic, Advanced and Specialty Courses**
- **We can advise on diving locations in Australia and overseas**
- **Ask about our DIVE CLUB 2000 It's Oceans of Fun!**

**OPEN
6 DAYS
9 AM TO 6 PM
We believe
in Service**



NOW YOU CAN DIVE JERVIS BAY IN YOUR LOUNGEROOM.

Hit the depths with dolphins, turtles and whales. Swim with cuttlefish, weedy sea dragons and blue wrasse. Discover caves, massive stone archways and thousands of species of exotic plants and animals.

All from the comfort of your favourite chair.

How? By watching Jervis Bay Sea Sports' special loan video.

In addition to showing you the natural wonders that make Jervis Bay one of Australia's top diving spots, it features the first-class services and facilities offered by Jervis Bay's largest professional diving organisation - Jervis Bay Sea Sports.

So, if you or your group have been thinking about diving Jervis Bay, you can look before you take the plunge. For a copy of the video, and a free colour brochure, simply phone, fax or write.



**JERVIS BAY
SEA SPORTS
MAKING DIVING FUN**

47 Owen Street, Huskisson NSW 2540 Australia
Tel: (044) 41 5012, 41 5598. Fax: (044) 416 723.

Adventors 916

Darryl's Tackle & Dive
66 Princes Highway,
Narooma NSW 2546
Telephone: (044) 76 2111

Owner: Darryl Stuart.

Certification: FAUI.

Courses Offered: Open water.

Full time, part time courses and equipment supplied.

Cost per Course: Basic \$300.

Dive charter available.

Services Available: Dive charter to Montague Island, air fills, equipment hire, sales.

Deep 6 Diving Pty Ltd
1057 Victoria Road,
West Ryde NSW 2114
Telephone: (02) 858 4299
Fax: (02) 858 4151

461 Church Street,
North Parramatta NSW 2150
Telephone: (02) 630 7422

185 Pittwater Road,
Manly NSW 2095
Telephone: (02) 977 5966
Fax: (02) 977 5362

86 Bayswater Road,
Rushcutters Bay NSW 2011
Telephone: (02) 361 4481
Owner/Chief Instructor: Paul and Marinka Rosman.
Certification: SSI.

Courses Offered: Open water, advanced, rescue, dive control specialists, associate instructor, instructor, other specialty courses.

Full time, part time courses and equipment supplied.

Cost Per Course: Basic \$325; Advanced \$370.

Dive charter available, dive club and newsletter.

Services Available: Sales, service, hire, hydros, boat dives, weekend trips, overseas travel, Barrier Reef travel, instruction, boat hire.

Comments: Full service at four convenient locations. Experts in Pacific dive travel and wreck/deep diving.



The Dive Centre
40 Kingsway, Cronulla NSW 2230
Telephone: (02) 523 7222
Fax: (02) 527 3247

Owner/Chief Instructor: Neal Robinson.
Certification: FAUI/NAUI.

Courses Offered: Snorkel, basic, assistant instructor.

Full time, part time courses and equipment supplied.

Cost Per Course: Basic \$340; Advanced \$295.

Dive charter available, dive club and newsletter.

Services Available: Schools, sales, hire, service, travel local and overseas, active dive club, seven days.



Dive Quest
30 Mullaway Drive,
Mullaway NSW 2456
Telephone: (066) 54 1930

Owner/Chief Instructor: Chris Connell/Gary Thompson.

Certification: NAUI/PADI.

Courses offered: Basic scuba to instructor. Also snorkelling.

Full time, part time courses and equipment supplied.

Cost per Course: Basic \$320; Advanced \$320.

Dive charter available, dive club and newsletter.

Services Available: Large range of equipment for sale or hire, qualified equipment servicing, active social club including overseas travel. Daily boat charters to the northern Solitary Islands.

Dive 2000 Pty Ltd
2 Military Road,
Neutral Bay NSW 2089
Telephone: (02) 953 7783
Fax: (02) 953 2245

Owner/Chief Instructor: Kevin and Christine Deacon.

Certification: PADI.

Courses Offered: All PADI courses, basic, advanced, night, rescue, PADI medic, deep, wreck, underwater photo-

graphy, underwater navigator, Dive-master.

Full time, part time courses and equipment supplied.

Cost Per Course: Basic \$325; Advanced \$235.

Dive charter available, dive club and newsletter.

Services Available: Sales, service, hire, travel consultancy — group trips, photo sales, service, hire, air fills, dive club, specialise in photography and travel, marine photo library video and cinematography.

Fathom Diving

174-176 Sydney Road,

Fairlight NSW 2094

Telephone: (02) 949 6255

Fax: (02) 977 0193

1075 Victoria Road,

West Ryde NSW 2114

Telephone: (02) 804 6744

Owner: Ted Lougher/David Oldfield.

Certification: CMAS/PADI/NAUI.

Courses Offered: All levels of certification up to instructor.

Full time, part time courses and equipment supplied.

Cost Per Course: Basic \$300; Advanced \$160.

Dive charter available, dive club and newsletter.

Services Available: All diver services — schools, equipment service and repair, hire, travel, boat dives, full underwater video service.

Comments: We are the only foreign language school in Sydney — French, German and Japanese. Also only diving-Sony agent in NSW.



Forster Fishermans Wharf

Wharf Street, Forster NSW 2428

PO Box 608, Forster NSW 2428

Telephone: (065) 54 7478

Fax: (065) 54 9446

Owner/Chief Instructor: Ron Hunter/
Phil Bowman

Certification: PADI.

Courses Offered: Open water, ad-

vanced, rescue, deep, search and recovery, underwater hunter, underwater photographer, underwater navigator, equipment specialist, research, night, shark diver, Divemaster.

Full time, part time courses and equipment supplied.

Cost Per Course: \$350; Advanced \$225.

Dive charter available, dive club and newsletter.

Services Available: Sales skin and scuba equipment, equipment servicing, daily dive charters, dive travel in Australia and overseas, full range rental gear, fast air fills.

Comments: Dive Charters operate at Forster and Seal Rocks, swim with colonies of grey nurse sharks only three hours north of Sydney.



Frog Dive

479 Anzac Parade,

Kingsford NSW 2032

Telephone: (02) 349 6333

Owner/Instructor: Peter Cross

1/20 Castlereagh Street,

Penrith NSW 2750

Telephone: (047) 32 3511

Owner/Instructor: Mark Byass

7A Miller Street,

Merrylands NSW 2160

Telephone: (02) 637 2144

(02) 637 2146

Fax: (02) 637 4167

Owner/Instructor: Bob Taylor

539 Willoughby Road,

Willoughby NSW 2068

Telephone: (02) 958 5699

Fax: (02) 958 3267

Owner/Instructor: Peter Easson

Certification: NAUI.

Courses Offered: Open water 1 through instructor. At Willoughby instructor preparation and orientation courses, video post-production facility.

Full time, part time courses and equipment supplied.

Cost Per Course: Basic \$350; Advanced \$325.

Dive charter available, dive club and newsletter.

Services Available: Hydrostatic test station, NAUI instructor training, full range of retail equipment, extensive travel experience. At Willoughby video post-production facility on site and heated pool, free scuba experience.

Atlantis Divers

LOCATED RIGHT ON THE WATER

FRONT AT PALM BEACH. THE WELL

EQUIPPED DIVE SHOP HAS ITS OWN

WHARF WITH THE DIVE BOAT RIGHT

ALONG SIDE THE SHOP. NO LUGGING

OF HEAVY DIVE GEAR.



BOAT DIVES DAILY

at 9 am — 11 am — 1 pm

RENTAL — AIR — SALES — SERVICE

BOOKINGS & ENQUIRIES

PHONE 919 4261

Barrenjoey Boathouse, Governor Phillip Park, Palm Beach 2107.



DIVE KIAMA

Master Marine Divers

Kiama Wharf,

Kiama 2533

**All types of
courses from
\$180.00.**

Part-time and live-in courses.

**Sales, service, boat dives,
air fills, hydro testing and
beautiful surroundings.**

PHONE (042) 32 3229

A.H. (02) 625 0643

Fun Dive Centre
255 Stanmore Road,
Stanmore NSW 2048
Telephone: (02) 569 5588
Fax: (02) 560 3872
 Chief Instructor: Rob Cason.
 Certification: SSI.

Courses Offered: Open water diver to instructor and all recognised specialties. Full time, part time courses and equipment supplied.

Cost Per Course: Basic \$325; Advanced \$295.

Dive charter available, dive club and newsletter.

Services Available: Sales, equipment service, equipment rental, local, interstate and overseas travel, heated training pool on-site, specialising in deep and wreck diving.

Illawarra Aqua Centre
235 Windang Road,
Windang NSW 2503
Telephone: (042) 96 4215
Fax: (042) 96 4215

Owner/Chief Instructor: Les Griffin/ Donna Appleby.

Certification: PADI 5 Star.

Courses Offered: Open water, advanced, rescue, MFA, Divemaster, boat handling, night, kelp, deep, wreck, search and recover, underwater hunter, photography, chamber diver equipment.

Full time, part time courses and equipment supplied.

Cost Per Course: \$215; Advanced \$190.

Dive charter available, dive club and newsletter.

Services Available: Sales, hire, charter, dive schools travel, servicing equipment.

Jervis Bay Sea Sports
47 Owen Street,
Huskisson NSW 2540
Telephone: (044) 41 5598
Fax: (044) 41 6723

Owner/Chief Instructor: Adrian Cookson.

Certification: PADI.

Courses offered: Skindiver, open water diver, advanced, rescue, deep, underwater navigator, photography, night, equipment, wreck, marine life 1 and 2 with Reg Lipson, Divemaster, search and recovery.

Full time, part time courses and equipment supplied.

Cost Per Course: Basic \$300; Advanced \$196.

Dive charter available, dive club and newsletter.

Services Available: Daily dive charters, dive packages 2, 3, 4 and 5 days, boat dives, accommodation at our Sea Sports Lodge, air fills, rental gear, sales and service.

Comments: Loan video on request.

Liverpool Diving School
137 George Street,
Liverpool NSW 2170
Telephone: (02) 601 3130
Fax: (02) 601 4212

Owner/Chief Instructor: James Kovacs.
 Certification: PADI.

Courses Offered: Open water, advanced, rescue, night diver, photography, deep diving, Divemaster.

Full time, part time courses and equipment supplied.

Cost Per Course: Basic \$280; Advanced \$220.

Dive club and newsletter.

Services Available: Sales, equipment service, PADI dive Centre 1990 active member.



Master Marine Divers
C/- Kiama Wharf, Kiama NSW 2533
Telephone: (042) 32 3229

Owner/Chief Instructor: Tany Arau- antinos

Certification: PADI/FAUL.

Courses Offered: Basic to instructor, night diver, deep diver, rescue diver, equipment specialist, hookha, diver research.

Full time, part time courses and equipment supplied.

Cost Per Course: Basic \$180; Advanced \$220.

Dive charter available, dive club and newsletter.

Services Available: Sales, service, night diving, course accommodation, "Winter Special FREE Boat Dives".

Comments: We offer a friendly and full service to allow divers to enjoy their sport.

Norfolk Diving
Taylors Road, Norfolk Island 2899
Telephone: (0011) 6723 2618
Fax: (0011) 6723 2276

Owner/Chief Instructor: Kerry Coop.

Certification: PADI.

Courses Offered: Introductory, open water, advanced, rescue.

Full time, part time courses and equipment supplied.

Cost Per Course: Basic \$350; Advanced \$225.

Dive charter available and dive club.

Services Available: Tax free dive and fishing equipment sales, equipment service, booking service for air fares, accommodation, hire cars to Norfolk for groups and individuals.

Port Macquarie Dive Centre
Shop 7, Port Marina, Park Street,
Port Macquarie NSW 2444
Telephone: (065) 83 8483
Fax: (065) 83 5557

Certification: PADI.

Courses Offered: Open water, advanced open water, deep diving, wreck diving, research diving, underwater photography, night diving, rescue, Divemaster assistant instructor.

Full time, part time courses and equipment supplied.

Cost Per Course: Basic \$325; Advanced \$275.

Dive charter available, dive club and newsletter.

Services Available: Sales, equipment service, travel, dive and fishing charters. Comments: Weekend and weekly accommodation diving and fishing packages available, and we also dive the famous Fish Rock Caves.

Pro Dive Drummoyne
227 Victoria Road,
Drummoyne NSW 2047
Telephone: (02) 819 7711
Fax: (02) 719 8047

Owner/Chief Instructor: Kent Gorrell.
 Certification: PADI.

Courses Offered: Open water, advanced, deep, wreck, night, rescue, Divemaster, assistant instructor, shark, underwater navigation, research, underwater photography, equipment, underwater hunter.

Full time, part time courses and equipment supplied.

Cost Per Course: Basic \$345; Advanced \$225.

Dive charter available, dive club and newsletter.

Services Available: A wide range of top quality equipment at competitive prices, warratied equipment servicing, all brands, overseas travel, local dives (both boat and shore), weekend excursions, top quality hire gear available.

Pro-Dive Hornsby
357 Pacific Highway,
Asquith NSW 2077
Telephone: (02) 477 6764
Fax: (02) 477 6764

Owner/Chief Instructor: Don Meekins/ Noel Watson.

Certification: 5 Star PADI

Courses Offered: Open water, advanced, rescue, MFA, deep, wreck, salvage, navigation, equipment, night, shark, Divemaster, assistant instructor, IDC, DPV, photography, snorkelling. Full time, part time courses and equipment supplied.

Cost Per Course: Basic \$345; Advanced \$225.

Dive charter available, dive club and newsletter.

Services Available: Full sales, equipment service, air fills, hire gear, travel, hydros, wet suit repairs, boat dives, schools diver education.



Pro Dive Penrith
103 Henry Street,
Penrith NSW 2750
Telephone: (047) 31 2866

Owner/Chief Instructor: Stuart Robb/ Janelle Shepherd.

Certification: PADI.

Courses Offered: Open water, advanced, rescue, Divemaster, instructor preparatory courses, medic first aid, nine specialty courses.

Full time, part time courses and equipment supplied.

Cost Per Course: Basic \$345; Advanced \$250.

Dive charter available, dive club and newsletter.

Services Available: Equipment sales and service, diver travel, air fills, hire gear.

Scuba Warehouse
Shop 1, Parramall,
Corner George Street,
Horwood Place,
Parramatta NSW 2124
Telephone: (02) 689 1389
Fax: (02) 891 2256

Owner/Chief Instructor: Judith McDonald.

Certification: PADI.

Courses Offered: Open water, advanced, MFA, rescue, deep, wreck, night, search and recovery, equipment, altitude diving distinctive specialist, master scuba diver, Divemaster, assistant instructor.

Full time, part time courses and equipment supplied.

Cost Per Course: Basic \$325; Advanced \$295.

Dive charter available, dive club and newsletter.

Services Available: Retail: All major brands stocked at extremely competitive prices, full servicing, hydro service, regular dive travel packages, locally and overseas (Truk, Fiji, Papua New Guinea, Vanuatu), regular night dives Wednesday and Friday evenings, Saturday and Sunday shore dives, boat charters — Sydney, Jervis Bay, Port Stephens, 5-Star PADI training facility.

Shiprock Dive

6/617 Port Hacking Road,
Lilli Pilli NSW 2229

Telephone: (02) 526 2664

Fax: (02) 526 2906

Owner/Chief Instructor: Sue Sainsbury/
Paul Millard.

Certification: PADI.

Courses Offered: Open water, advanced open water, rescue, medic first air, underwater photography, underwater navigation, deep, wreck, night, Divemaster assistant instructor.

Full time, part time courses and equipment supplied.

Cost Per Course: Basic \$295; Advanced \$195.

Dive charter available, dive club and newsletter.

Services Available: Sales — all brands, special tax free sales to overseas travellers, qualified to service all brands, qualified technician, extensive experience and expertise in travel.

Comments: Our professional dive centre provides the full range of diver service. We pride ourselves on our reputation for maintaining consistently high standards in all facets of our business and providing the highest level of customer service. We train a very large number of junior divers as well as teaching special needs groups such as paraplegics and quadriplegics. We have a flawless safety record and intend to keep it that way. We can arrange charter boats, 12 scheduled boat dives every weekend; weekends away and specialise in dive travel and tax free sales to overseas travellers. We aim to keep our divers diving — safely.



St George Underwater Centre
458 King Georges Road,
Beverly Hills NSW 2209
Telephone: (02) 502 0268,
(02) 502 2221

Fax: (02) 502 4657

Owner/Chief Instructor: Neil Doig.

Certification: PADI 5 Star.

Courses Offered: Open water, ad-

vanced, rescue, Divemaster, assistant instructor, all specialties including equipment, deep and wreck.

Full time, part time courses and equipment supplied.

Cost Per Course: Basic \$295; Advanced \$200.

Dive charter available, dive club and newsletter.

Services Available: Sales of all top brands, quality hire equipment, travel trips with dive club, shore and night dives led by Divemasters, active social club.



Sub Aquatic Training Pty Ltd

484 King Georges Road,
Beverly Hills NSW 2209

Telephone: (02) 570 4222

Owner/Chief Instructor: Noel Taylor/
Colin Hanson.

Certification: FAU.

Courses Offered: Basic, advance/night diver, diver lifesaver, deep diver, equipment specialist, search and recovery, underwater photography.

Full time, part time courses and equipment supplied.

Cost Per Course: Basic \$290; Advanced \$300.

Dive charter available, dive club and newsletter.

Services Available: Sales, equipment service, local and overseas travel, dive charter, further education courses.

Sundive Dive Centre

15 Fletcher Street,
Bryon Bay NSW 2481

Telephone: (066) 85 7755

Fax: (066) 85 8215

Owner/Chief Instructor: Rod Gray/
Greg Murrell.

Certification: NAUI.

Courses Offered: All recognised NAUI courses.

Full time, part time courses and equipment supplied.

Cost Per Course: Basic \$350; Advanced \$295.

Dive charter available, dive club and newsletter.

Services Available: Sales, equipment service, travel, hire, instruction, charter, sightseeing trips, snorkel trips.

Comments: NAUI Pro Facility.

Looking for a GOOD TIME in Sydney?

Become an **AQUAHOLIC!**

- FULL RANGE OF PADI SPECIALTIES
- WEEKLY SHORE AND BOAT DIVES
- NIGHT DIVES AND MIDWEEK DIVES
- ADVENTURE HOLIDAYS

REGULAR AQUAHOLICS ANONYMOUS THERAPY SESSIONS!

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689 1389

NOT BIGGEST — JUST BEST

SCUBA WAREHOUSE

PADI 5-STAR DIVE CENTRE
CNR. GEORGE STREET
& HORWOOD PLACE,
PARRAMATTA
NEXT TO ROXY PICTURE THEATRE
FAX: 891 2256

LOOKING FOR VALUE?

JERVIS BAY TRIPS \$85

Four boat dives and accommodation.

PHILIPPINES DIVE TRIPS \$1395

For two weeks

Departures October & March

LEARN TO DIVE SCHOOLS \$250

Including eight shore dives, two boat dives.

ADVANCED COURSE \$250

Six shore dives, four boat dives.

**COMPETITIVE PRICES ON WIDE RANGE OF
DIVE EQUIPMENT
ALL IN SHOP FACILITIES.**

MIRANDA DIVE SHOP

7 BEACHPARK AVENUE, CRONULLA, NSW 2230
PHONE: (02) 527 1518



Shiprock Dive

THE FRIENDLY DIVE SHOP

BEST COURSES

BEST PRICES

PROUD TO BE A PADI DIVE CENTRE

- ★ Courses to Assistant Instructor
- ★ Dive Club
- ★ Boat Dives
- ★ All brands at great prices
- ★ Service technician on premises

Phone (02) 526 2664 Fax (02) 526 2906

6/617 PORT HACKING ROAD,
LILLI PILLI NSW 2229

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DIVING NEEDS SEE . . .

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"THE DIVING SPECIALISTS"

- ★ ALL SALES
- ★ AIRFILLS
- ★ HIRE
- ★ SERVICE OF ALL EQUIPMENT
- SAA TEST STATION NO. 146A
- ★ SCUBA SCHOOLS
- ★ DIVE TRAVEL
- ★ DIVE WOLLONGONG & JERVIS BAY ABOARD OUR FULLY SURVEYED CHARTER BOAT

6 Victoria St, Wollongong
Phone: (042) 28 5962

Ulladulla Divers Supplies

Shop 10, Wason Street,
Ulladulla NSW 2539
Telephone: (044) 55 2695
(044) 55 5303

Fax: (044) 55 2508

Owner: Rob Thorman/Carmen Ross.

Certification: PADI/SSI.

Courses Offered: All SSI through to instructor. PADI all specialties, open water, advanced, night, wreck, deep, search and recovery, navigation, research, rescue, Divemaster, dive assistant instructor, SSI assistant instructor, snorkel classes.

Full time, part time courses and equipment supplied.

Cost Per Course: Basic \$320; Advanced on application.

Dive charter available, dive club and newsletter.

Services Available: Sales, equipment service, hire, club trips overseas, boat charter, specialised dive service.

Comments: Open 7 days Monday to Friday 9-5, Saturday 7-5, Sunday 7-4, Sunday Sippers 3 pm.

Byron Bay Dive Centre

9 Lawson Street,
Byron Bay NSW 2481
Telephone: (066) 85 7149
Fax: (066) 85 7942

Owner: Bill Antico.

Certification: NAUI.

Courses Offered: Open water 1 through to instructor course.

Full time, part time courses and equipment supplied.

Cost Per Course: Basic \$395; Advanced \$295.

Dive charter available and dive club.

Services Available: Equipment sales, travel dive trips, equipment service and tank testing.

Comments: NAUI Professional Development Centre.

NORTHERN TERRITORY

Coral Divers

Shop 1, 42 Stuart Highway,
Stuart Park Darwin 0820
Telephone: (089) 81 2686
Fax: (089) 81 2686

Chief Instructor: Sasha Muller.

Certification: NAUI.

Courses Offered: Beginner to instructor, wreck, deep, rescue, recovery.

Full time, part time courses and equipment supplied.

Cost Per Course: Basic \$359; Advanced \$369.

Dive charter available, dive club and newsletter.

Services Available: Remote area diving advice and regular trips inland and to isolated Territory dive locations.

Comments: Darwin's largest and fastest dive boat.



United Divers

6 Victoria Street,
Wollongong NSW 2500
Telephone: (042) 28 5962

Chief Instructor: Suzanne Fenwick.

Certification: PADI.

Courses Offered: Open water, advanced open water, rescue diver, equipment specialist, night diver, deep diver and Divemaster.

Part time courses and equipment supplied.

Cost Per Course: Basic \$200; Advanced \$260.

Dive charter available and newsletter.

Services Available: All dive equipment for sale including Oceanic, Dacor, Tabata, US Divers and Neptune. All hire equipment available, servicing and repair of all diving equipment, hydrostatic test station on the premises, regular local and overseas dive trips to destinations including Truk Lagoon, Solomons, Vanuatu, Fiji and the Coral Sea.

Fannie Bay Dive Centre

Shop 9, Fannie Bay Place,
Fannie Bay NT 0820
Telephone: (089) 81 3049
Fax: (089) 81 4913

Owner/Chief Instructor: Graham Wright.

Certification: PADI.

Courses Offered: Open water, advanced, rescue, Divemaster, medic first aid, photography, search and recovery, deep, night, equipment, instructor, wreck.

Full time, part time courses and equipment supplied.

Cost Per Course: Basic \$295; Advanced \$230.

Dive charter available, dive club and newsletter.

Services Available: Sales, service, equipment hire, charter, instant air.



Sand Pebbles Dive Shop
Delatour Street, Coconut Grove,
Darwin NT 0810

Telephone: (089 85 1906
(089) 27 5652

Owner/Chief Instructor: Martin Evans.
 Certification: PADI.

Full time, part time courses and equipment supplied.

Cost Per Course: Basic \$250; Advanced \$200.

Dive charter available and newsletter.
 Services Available: Hire, sales, service, travel, air fills, boat dives, international travel.

Comments: The longest established dive shop in the NT.

QUEENSLAND

Adventure Sports
49 Balaclava Street,
Woolloongabba Qld 4102
Telephone: (07) 391 3766
Fax: (07) 391 7804

Owner/Chief Instructor: Philip Feldman.

Certification: PADI/NAUI.
 Courses Offered: Open water, advanced, diver rescue, wreck, deep, equipment, night diving, Divemaster, assistant instructor.

Full time, part time courses and equipment supplied.

Cost Per Course: Basic \$220; Advanced \$275.

Dive charter available, dive club and newsletter.

Services Available: Sales, equipment service, travel (licensed travel agent), hire, air fills, local dive trips (daily), over-night dive trips.

Comments: Located near Brisbane central business district, we are serving the needs of divers throughout South East Queensland.



Anchorage Dive Centre
Anchorage Village Beach Resort,
Point Lookout,
North Stradbroke Island, Qld 4184
Telephone: (075) 49 8266
Fax: (075) 49 8304

Owner/Chief Instructor: Kevin W. Russell.

Certification: PADI.

Courses Offered: All to instructor, eight specialties, medic first aid, oxygen resuscitation.

Full time, part time courses and equipment supplied.

Cost Per Course: Basic \$350; Advanced \$295.

Dive charter available, dive club and newsletter.

Services Available: Full service dive store, we do everything, underwater video of your dive, budget resort accommodation.

Comments: Dives seven days a week on fully surveyed 7.3 metre charter vessel "Sequest".

Anglo Diving Services Australia
Shop 4, 47A Takalvan Street,
Bundaberg Qld 4670

Telephone: (071) 51 6422

Owner/Chief Instructor: Pat McSweeney.

Certification: PADI.

Courses Offered: Open water to assistant instructor and specialty courses. Full time, part time courses and equipment supplied.

Cost Per Course: Basic \$265; Advanced \$230.

Dive charter available, dive club and newsletter.

Services Available: Sales, hire, equipment service, buddy-finding service.

Barrier Reef Diving Services

PO Box 180,
Airlie Beach Qld 4802
Telephone: (079) 46 6204
Fax: (079) 46 7849

Owner/Chief Instructor: Tony Fontes.
 Certification: PADI.

Courses Offered: All courses (resort, open water, advanced, rescue, Divemaster, specialties).

Full time courses and equipment supplied.

Cost Per Course: Basic \$395; Advanced \$365.

Dive charter available and newsletter.
 Services Available: Sales, underwater

photography, marine park information, equipment service.

Comments: PADI 5 Star Training Facility.

Brisbane Dive Systems Pty Ltd
536 Rode Road,
Chermside Qld 4032

Telephone: (07) 359 3925

Fax: (07) 350 1027

Owner/Chief Instructor: Col McKenzie.
 Certification: SSI.

Courses Offered: Open water, advanced, Dive Con, associate instructor, wreck, night, deep, navigation, rescue. Full time, part time courses and equipment supplied.

Cost Per Course: Basic \$395; Advanced \$295.

Dive charter available, dive club and newsletter.

Services Available: Sales, repairs, hydros, travel, day trips, instruction, friendly advice.

Comments: We own our own divers lodge on Moreton Island.

Brisbane Scuba School
2422 Logan Road,
Eight Mile Plains Qld 4123
Telephone: (07) 341 9733

Owner/Chief Instructor: Steve Rossberg.

Certification: NAUI.

Courses Offered: NAUI open water, instructor, RLSSA courses, St Johns first aid courses.

Full time, part time courses and equipment supplied.

Cost Per Course: Basic \$350; Advanced \$320.

Dive charter available, dive club and newsletter.

Services Available: Sales and service, all major brands, travel, overseas, interstate and local.



St. George Underwater Centre

A PADI 5 STAR DIVE CENTRE
OPEN 7 DAYS A WEEK

- Professional instruction to all levels
- Regular courses (including specialties)
- Quality hire equipment
- Large range of retail stock

- Boat dives
- Free shore dives and night dives led by Divemasters
- Active social club
- Dive trips



ST. GEORGE UNDERWATER CENTRE

458 King Georges Road, Beverly Hills NSW 2209. Ph: (02) 50 0268 or (02) 502 2221

Cairns Underwater Camera Centre
 Corner Lake and Aplin Streets,
 Cairns Qld 4870
PO Box 6592, Cairns Qld 4870
Telephone: (070) 51 8722
Fax: (070) 31 2739
 Owner/Chief Instructor: Reefcam Pty Ltd.

Certification: PADI.
 Courses Offered: Underwater photography specialty, advanced dive.
 Full time, part time courses and equipment supplied.
 Dive charter available.
 Services Available: Full camera hire, filming equipment, video. Darkroom service, camera repair, service and hire.
 Comments: Regular charter boat departures for the Cod Hole and Coral Sea.
 Company policy is adventure diving for certified divers.

PADI

Capricorn Reef Diving
 150 Main Street,
 Rockhampton Qld 4701
Telephone: (079) 28 6671
Fax: (079) 28 8162
 Owner: Robert P. Freitag.
 Certification: PADI.
 Courses Offered: Open water to assistant instructor and specialty courses.
 Full time, part time courses and equipment supplied.
 Cost Per Course: Basic \$340; Advanced \$325.
 Dive charter available.
 Services Available: Sales, equipment service, advance bookings.

Deep Sea Divers Den
 319 Draper Street,
 PO Box 5264,
 Cairns Qld 4870
Telephone: (070) 51 2223
Fax: (070) 31 1210
 Owner: Tony Physick/David Johnson.
 Certification: PADI.
 Courses Offered: Open water, advanced, rescue, Divemaster.
 Full time, part time courses and equipment supplied.
 Cost Per Course: Basic \$340; Advanced \$315.
 Dive charter available.
 Services Available: Sales, service, equipment, travel, trips, instruction.
 Comments: We now have two shops; one as listed above and a new shop on the Boardwalk at the Pier Marketplace, Cairns.



The Dive Bell
 Shop 5, 141 Ingham Road,
 West End, Townsville Qld 4810
Telephone: (077) 01 1155
Fax: (077) 72 3119
 Owner/Chief Instructor: Colin Hodson.
 Certification: SSI.
 Courses Offered: Open water, advanced, specialties, Dive Con, assistant instructor.
 Part time courses and equipment supplied.
 Cost Per Course: Basic \$350; Advanced \$300.
 Dive charter available, dive club and newsletter.
 Services Available: Sales, equipment hire, service accredited facility, extended two-day dive trips to Coral Sea, Great Barrier Reef, wreck of Yongala.

Dive Boatique
 Shop 1, Noosa Mode,
 Sunshine Beach Road,
 Noosa Qld 4565
Telephone: (071) 47 4300
Fax: (071) 47 3032
 Owner/Chief Instructor: Owen Duggan.
 Certification: PADI.
 Courses Offered: Open water, advanced rescue, Divemaster, assistant instructor, specialties, night deep photography, research equipment.
 Full time, part time courses and equipment supplied.
 Cost Per Course: Basic \$350; Advanced \$295.
 Dive charter available.
 Services Available: Full sales, service, instruction. Travel hire fills, Lady Elliot Island bookings.
 Comments: Two eight metre shark cats surveyed for 10 passengers and two crew.

The Dive Site
 652 Ipswich Road,
 Annerley Qld 4103
Telephone: (07) 848 0696
 Owner/Chief Instructor: David Mann.
 Certification: NAUI.
 Courses Offered: Entry level to skin diving instructor, master instructor and instructor trainer on staff.
 Full time, part time courses and equipment supplied.
 Cost Per Course: Basic \$360; Advanced \$380.
 Dive charter available, dive club and newsletter.
 Services Available: Sales all brands, service available, tank hydros, travel Barrier Reef and overseas tours.

Diversion Dive Charters
 Lot 1, Oceanview Road,
 Oceanview Qld 4521
Telephone: (075) 85 3130
 Owner: Alan McNaught/Ken Desbrow.
 Certification: PADI.
 Courses Offered: Open water, rescue, advanced, Divemaster and specialties.
 Full time, part time courses and equipment supplied.
 Cost Per Course: Basic \$300; Advanced \$200.
 Dive charter available, dive club and newsletter.
 Services Available: All equipment available — best wreck diving in Australia, all within one hour from marina.
 Comments: Caves, soft and hard beautiful corals on Brisbane's own Barrier Reef.

Don Cowie's Down Under Aquatics Pty Ltd
 41 Shields Street,
 Cairns Qld 4870
PO Box 3,
Freshwater Via Cairns Qld 4870
Telephone: (070) 31 1588
Fax: (070) 31 3318
 Owner/Chief Instructor: Don Cowie/Glen Sutton.
 Certification: SSI.
 Courses Offered: Five day open water course, advanced, rescue, specialty courses, dive controller.
 Full time, part time courses and equipment supplied.
 Cost Per Course: Basic \$395; Advanced \$330.
 Dive charter available, dive club and newsletter.
 Services Available: Dive trips, extended and day, sale of equipment and servicing. We can also book any other tours and accommodation in the Cairns area.
 Comments: We specialise in dive trips and learn to dive courses and have been running this business for the last 10 years.



Downs Diving Centre
 16 Bowen Street,
 Toowoomba Qld 4350
Telephone: (076) 39 1330
 Owner/Chief Instructor: Malcolm Marsh, Vince Collins and Chris Gray.
 Certification: FAUI/NAUI.
 Courses Offered: Open water 1, Divemaster and assistant, instructor

specialties, deep, wreck, underwater environment, underwater photography, recovery diver.
 Full time, part time courses and equipment supplied.
 Cost Per Course: Basic \$400; Advanced \$400.
 Dive charter available, dive club and newsletter.
 Services Available: Equipment sales and service, local and overseas dive trips (escorted), professional diving services, air fills, equipment hire.
 Comments: Course costs include use of scuba equipment and weekend aboard luxury dive vessel. Discounts for groups and club members.



Get Wet Sports Pty Ltd
 Tangalooma Resort,
 Moreton Island Qld 4025
PO Box 1200, Eagle Farm Qld 4007
Telephone: (075) 48 2666
Fax: (075) 48 2232
 Owner/Chief Instructor: Leigh Meyer.
 Certification: NAUI.
 Courses Offered: Resort courses to Divemaster.
 Full time, part time courses and equipment supplied.
 Cost Per Course: Basic \$280; Advanced \$250.
 Dive charter available.
 Services Available: Sales (snorkelling equipment), limited service, other watersports instruction, waterskiing, sailboarding, jetski, boat hire.

Gold Coast Dive Centre
 20 Railway Street,
 Southport Qld 4215
Telephone: (075) 32 8088
Fax: (075) 91 7005

Owner: Burnie Grayson.
 Certification: PADI.
 Courses Offered: Open water through to PADI, instructor development courses and 12 specialty.
 Full time, part time courses and equipment supplied.
 Cost Per Course: Basic \$295; Advanced \$250.
 Dive charter available, dive club and newsletter.
 Services Available: Full comprehensive professional dive outlet, boat dives every day, scooter, video and 35mm camera hire. Longest established dive store on the Gold Coast.

H20 Sportz Pty Ltd
PO Box 19,
Hamilton Island Qld 4803
Telephone: (079) 46 9888
Fax: (079) 46 9888

Owner/Chief Instructor: Maree Smith,
 Rick Mansbridge and Tony Green.
 Certification: PADI.

Courses Offered: Open water, advanced, rescue, Divemaster, photography, deep, night, resort Divemaster, equipment, medic first aid, boat handling.

Full time, part time courses and equipment supplied.

Cost Per Course: Beginner \$430; Advanced \$375.

Dive charter available, dive club and newsletter.

Services Available: Sales, equipment service, day trips, training school.

Comments: We are a 5-Star training facility with both a Japanese Divemaster and Japanese instructor on the team.



Marlin Coast Divers
PO Box 50, Palm Cove Qld 4879
Telephone: (070) 59 1144
Fax No: (070) 59 1295

Owner/Chief Instructor: Mike Holme.
 Certification: PADI.

Courses Offered: Open water, advanced, rescue, Divemaster, medic first aid and specialties, wreck, equipment, night, photography, deep, reef ecology. Full time, part time courses and equipment supplied.

Cost Per Course: Basic \$425; Advanced \$435.

Dive charter available and dive club. Services Available: Sales, equipment service, accommodation package, booking advice on all tours.

Comments: We teach in small groups (maximum six) for greatest safety and personalised attention. Reef training dives aboard 'Quicksilver'. We also teach the disabled.

Mike Ball Watersports
252 Walker Street,
Townsville Qld 4810
Telephone: (077) 72 3022
Fax: (077) 21 2152

Certification: PADI.
 Courses Offered: Full range of PADI dive courses.

Full time, part time courses and equipment supplied.

Cost Per Course: Basic \$340; Advanced \$340.

Dive charter available, dive club and newsletter.

Services Available: Sales, dive expeditions, equipment service, training.

Orpheus Island Dive Center
Private Mail Bag 15,
Townsville Mail Centre,
Townsville Qld 4810
Telephone: (077) 77 7377
Fax: (077) 77 7533

Owner/Chief Instructor: Mark Bliss.
 Certification: PADI.

Courses Offered: Full range of PADI courses, plus specialties.

Full time, part time courses and equipment supplied.

Cost Per Course: Basic \$485; Advanced \$400.

Dive charter available.

Services Available: Sales, equipment, service.

Pro Dive Cairns
Marlin Parade,
Cairns Qld 4870
Telephone: (070) 31 5255
Fax: (070) 51 9955

Owner/Chief Instructor: Rod Punshon.
 Certification: PADI.

Courses Offered: Open water, advanced, rescue, Divemaster, assistant instructor, eight specialty courses. Full time courses and equipment supplied.

Cost Per Course: Basic \$350; Advanced \$325.

Dive charter available, dive club and newsletter.

Services Available: Sales, hire, travel, dive courses, dive trips.

Comments: We are a PADI 5-Star training facility and we offer the best three day/2 night outer reef dive trips from the Cairns area.

Pro-Dive Townsville
Shop 3, Great Barrier Reef
Wonderland, Flinders Street,
Townsville Qld 4810
Telephone: (077) 21 1760
Fax: (077) 21 1791

Owner/Chief Instructor: Greg Webster.
 Certification: PADI.

Courses Offered: Open water, advanced, rescue, Divemaster, wreck diving, deep diving, night diving, photography.

Full time, part time courses and equipment supplied.

Cost Per Course: Basic \$325; Advanced \$265.

Dive charter available, dive club and newsletter.

Services Available: Sales, service, travel, hire, charter boats, fishing trips.

Comments: Townsville's best dive crew.



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with

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DE LATOUR ST, COCONUT GROVE,
NORTHERN TERRITORY.
PH: (089) 85 1906.



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- ★ SHARK AND MANTA DIVES.
- ★ PADI 5 STAR.
- ★ FULL EQUIPMENT HIRE.
- ★ SCOOTERS
- ★ VIDEOS & CAMERAS

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| ★ DIVE TRAVEL | ★ BOAT DIVES |

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(08) 294 7744

Patawalonga Frontage, North Glenelg, SOUTH AUSTRALIA



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PADI DIVE CENTRE
INTERNATIONAL SCUBA COURSE
BEGINNERS TO DIVE MASTER
EQUIPMENT, SALES & SERVICE

(08) 269 6987

169 Main North Road, Nailsworth, S.A.

Pro Dive Brisbane

Corner Milton & Baroona Roads,
Milton Qld 4064

Telephone: (07) 368 3766

Owner/Chief Instructor: Steve Hills.

Certification: PADI.

Courses Offered: Open water through to master instructor, all in-house, full range of special interest courses.

Full time, part time courses and equipment supplied.

Cost Per Course: Basic \$395; Advanced \$295 (\$270 club).

Dive charter available, dive club and newsletter.

Services Available: Retail sales, equipment service, dive travel through our own licensed travel agent (Sea Life Travel), instant credit with three months interest free purchases.

Comments: Brisbane's only PADI 5-Star instructor development centre.



Scuba World

36A High Street,
Toowong Qld 4066

Telephone: (07) 870 9030

Owner: Ian McKinnon.

Certification: SSI.

Courses Offered: Open water to instructors.

Full time, part time courses and equipment supplied.

Cost Per Course: Basic \$450; Advanced \$250.

Dive charter available, dive club and newsletter.

Services Available: Sales, equipment service, travel.

Comments: Open Monday to Friday and Saturday morning.

Scuba World

The Wharf, Parkyn Parade,
Mooloolaba Qld 4557

Telephone: (071) 44 8595

Fax: (071) 44 8596

Chief Instructor: Samuel Long.

Certification: SSI.

Courses Offered: Open water, advanced open water, stress rescue, Divemaster, assistant instructor, instructors and all specialties.

Full time, part time courses and equip-

ment supplied.

Cost Per Course: Basic \$450; Advanced \$250.

Dive charter available, dive club and newsletter.

Services Available: Sales, equipment service, travel, accommodation, shark dives in Underwater World Mooloolaba. Comments: Open seven days, diving seven days, classroom, pool and ocean training all at one location.

Tropicana Dive

12-14 Anzac Parade,
Yeppoon Qld 4703

Telephone: (079) 39 4642

Fax: (07) 264 1820

Owner/Chief Instructor: Rudi Sokac/Rick Mark.

Certification: SSI.

Courses Offered: Open water, open water advanced, specialty, rescue, dive controller.

Full time, part time courses and equipment supplied.

Dive charter available, dive club and newsletter.

Services Available: Equipment sales, equipment service and equipment hire, air fills, dive trips — day, weekend and charter.



SOUTH AUSTRALIA

Adelaide Skin Diving Centre

7 Compton Street,
Adelaide SA 5000

Telephone: (08) 231 6144

Fax: (08) 212 5887

Owner/Chief Instructor: Paul Lunn.

Certification: FAUL.

Courses Offered: Basic, advanced, instructor.

Full time, part time courses and equipment supplied.

Cost Per Course: Basic \$325; Advanced \$175.

Dive charter available, dive club and newsletter.

Services Available: Sales, service, travel (local, interstate and overseas), hire, charter boat.

Comments: Charter boat 34 foot luxury 'MV Scuba'.

Adventureland Diving
C/- Penneshaw Post Office,
Kangaroo Island SA 5222
Telephone: (0848) 31072
(0848) 31002

Owner/Chief Instructor: John S. Lavers.
 Certification: FAUL.
 Courses Offered: Scuba diver, advanced, master diver, Divemaster, assistant instructor.
 Full time courses.
 Cost Per Course: Basic \$343; Advanced \$343.
 Dive charter available.
 Services Available: Accommodation, hire, air filling, dive charter, equipment service, sales.
 Comments: Additional activities include abailing and parasailing.



Divers International
510 Goodwood Road,
Daw Park SA 5041
Telephone: (08) 271 7866
Fax: (08) 271 7065

Owner/Chief Instructor: Barry Peart.
 Certification: NAUI.
 Courses Offered: Beginners to instructor and all specialties.
 Full time, part time courses and equipment supplied.
 Cost Per Course: Basic \$320; Advanced \$280.
 Dive charter available, dive club and newsletter.
 Services Available: Sales, equipment service, travel, air fills, hire equipment.
 Comments: SA's only on-site heated training pool, especially designed for dive training. Winter course specials.

Divers Service
80 Grange Road, Welland SA 5007
Telephone: (08) 346 3422
Fax: (08) 340 2578
 Owner: Steve Robinson and Mark Snadden.
 Certification: FAUL.
 Courses Offered: From basic right through to one star instructor.
 Full time, part time courses and equipment supplied.
 Cost Per Course: Basic \$320; Advanced \$150 to \$300.
 Dive charter available, dive club (free) and newsletter.
 Services Available: Test station, equipment service, sales, instruction, weekly dives organised, weekend trips away organised, charter boat trips organised — K.I., Althorpes etc.

Flinders Diving Services
23 Mallee Crescent,
Port Lincoln SA 5606
Telephone: (086) 82 4140
Fax: (086) 82 1851

Owner: Martin and Lyn Phillips.
 Certification: PADI.
 Courses Offered: All.
 Full time, part time courses and equipment supplied.
 Cost Per Course: Basic \$300; Advanced \$240.
 Dive charter available, dive club and newsletter.
 Services Available: Sales, hydro testing, charter, service manufacture of FDS Hookah systems.
 Comments: We also offer the unique charter service viewing the great white sharks from cages — group bookings only.

Freeform Dive and Surf
66 Bay Road,
Allendale East SA 5291
Telephone: (087) 38 7300
Fax: (087) 38 7300

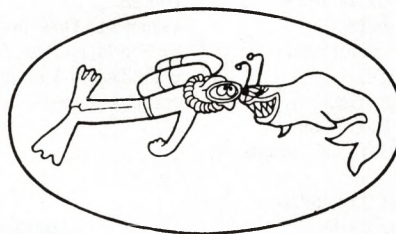
Owner/Chief Instructor: Graham Polard and Chris Schulze.
 Certification: PADI.
 Courses Offered: Open water, advanced, first aid, rescue and specialty.
 Part time courses and equipment supplied.
 Cost Per Course: Basic \$300; Advanced \$210.
 Services Available: Sales, hire gear available, equipment service.



Glenelg Scuba Diving
Patawalonga Frontage,
North Glenelg SA 5045
Telephone: (08) 294 7744
Fax: (08) 294 2911

Owner/Chief Instructor: Derek Randall.
 Certification: PADI.
 Courses Offered: Open water, advanced, rescue, Divemaster, instructors, night, deep, equipment, search and salvage, underwater photography, cook and catch etc.
 Full time courses.
 Cost Per Course: Basic \$320; Advanced \$200.
 Dive charter available, dive club and newsletter.
 Services Available: Sales, equipment, service — all major brands — travel.
 Comments: 5-Star PADI dive shop.

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Penneshaw, 5222
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Gold Professional Scuba Training Facility

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 FLINDERS DIVING SERVICES
 PORT LINCOLN
 PHONE (086) 82 4140
 FAX (086) 82 1851**

Port Lincoln Skindiving and Surfing
73 Mortlock Terrace,
Port Lincoln SA 5606
Telephone: (086) 82 4428
Fax: (086) 82 4428
 Chief Instructor: Bob Ramsay.
 Certification: PADI.
 Courses Offered: Open water, advanced, rescue, Divemaster.
 Part time courses and equipment supplied.
 Cost Per Course: Basic \$250.
 Dive club and newsletter.
 Services Available: Sales, equipment service, hire.

Rapid Dive Centre
180 Main North Road,
Prospect SA 5082
Telephone: (08) 344 1166
Fax: (08) 344 1213
 Owner/Chief Instructor: Joe Csorstan.
 Certification: PADI.
 Courses Offered: Basic to advanced.
 Full time, part time courses and equipment supplied.
 Cost Per Course: Basic \$320; Advanced \$195.
 Dive club and newsletter.
 Services Available: Equipment, weekend dive trips.

Scuba World
169 Main North Road,
Nailesworth SA 5083
Telephone: (08) 269 6987
Fax: (08) 294 2911
 Owner/Chief Instructor: Peter Blight.
 Certification: PADI.
 Courses Offered: Open water, advanced open water, rescue, Divemaster, night, deep, wreck, equipment specialty, search and salvage.
 Full time courses and equipment supplied.
 Cost Per Course: Basic \$320; Advanced \$200.
 Dive charter available, dive club and newsletter.
 Services Available: Sherwood, Seatec, Mares, Apollo, Sterling, Oceanic, Tekana, Delta, Monago, Airdive Sea Suits.

Southern Diving Centre
1 Roy Terrace,
Christies Beach SA 5165
Telephone: (08) 382 1322.
 Owner/Chief Instructor: Grant Hersey and David Brooksby.
 Certification: PADI/FAUI.
 Full time, part time courses and equipment supplied.
 Dive charter available.
 Services Available: Sales, equipment

service, dive travel, instruction, PADI or FAUI, basic open water to instructor, plus a wide range of specialty courses.
 Comments: Only dive shop situated at Pt Noarlunga Reef. Shop facilities include heated 10m dive training tank and classroom facilities for courses.



Super Elliotts Dive Centre
200 Rundle Street,
Adelaide SA 5000
Telephone: (08) 232 0339
Fax: (08) 232 3403
 Manager/Chief Instructor: Brad Dempster.
 Certification: FAUI.
 Courses Offered: Open water through to instructor with all specialty courses.
 Full time, part time courses and equipment supplied.
 Cost Per Course: Basic \$320; Advanced \$165.
 Dive charter available, dive club and newsletter.
 Services Available: Offer full pro dive shop services, sales, servicing, tank testing, holidays, weekend diving, regular weekends away.
 Comments: The shop's emphasis is on quality and service, free loan equipment on all services or repairs.

Underwater Sports Diving Centre
1198 Grand Junction Road,
Hope Valley SA 5090
Telephone: (08) 263 3337
 Owner/Chief Instructor: Richard Megan and Dusan Uglesic.
 Certification: FAUI.
 Courses Offered: Open water, advanced, all specialty courses, Divemaster, instructor, cave diving.
 Part time courses and equipment supplied.
 Cost Per Course: Basic \$320; Advanced from \$130.
 Dive charter available, dive club and newsletter.
 Services Available: Sales, equipment, service, hire, travel, social dives, air fills, instruction.

TASMANIA

Bicheno Dive Centre
4 Tasman Highway,
Bicheno Tas 7215
Telephone: (003) 75 1138
Fax: (003) 75 1504
 Owner/Chief Instructor: Tony Dovelas and Rick Smith.
 Certification: PADI/FAUI.
 Courses Offered: Open water to assistant instructor.
 Full time, part time courses and equipment supplied.
 Cost Per Course: Basic \$300; Advanced \$170.
 Dive charter available, dive club and newsletter.
 Services Available: Sales, equipment hire, tank fills, equipment service, dive charter and packages, accommodation.
 Comments: Operate seven days a week for one or more.

Charltons Scuba Education Services
155-157 Brisbane Street,
Launceston Tas 7250
Telephone: (003) 31 8322
Fax: (003) 31 6080
 Owner/Chief Instructor: Wayne Williams, Stephen Harway and Geoff Stubbs.
 Certification: FAUI.
 Courses Offered: Basic, advanced, master diver courses, Divemaster, assistant instructor.
 Full time, part time courses and equipment supplied.
 Cost Per Course: Basic \$320; Advanced \$185.
 Dive club and newsletter.
 Services Available: Sales and service, equipment hire, air fills (instant), international dive travel arranged, dive club.
 Comments: Northern Tasmania's only FAUI professional scuba training facility.

The Dive Shop
42 Bathurst Street,
Hobart Tas 7001
Telephone: (002) 34 3428
 Owner/Chief Instructor: Frank Godleman.
 Certification: PADI.
 Courses Offered: Open water through to assistant instructor plus all specialty courses.
 Full time, part time courses and equipment supplied.
 Cost Per Course: Basic \$265; Advanced \$195.
 Dive charter available, dive club and newsletter.
 Services Available: Local dive trips, weekend trips, sale of most popular brands plus servicing and overseas travel.

Diversified Diving Services
139 Main Road,
Sorell Tas 7172
Telephone: (002) 65 1148
Fax: (002) 65 2598
 Owner: Gary Myers.
 Certification: FAUI.
 Courses Offered: All.
 Full time, part time courses and equipment supplied.
 Cost Per Course: Basic \$300; Advanced \$120-\$250.
 Dive charter available and dive club.
 Services Available: Equipment, sales, hire, tuition, charter, travel, transport and accommodation.

Scuba Centre
62 Scenic Drive,
East Wynyard Tas 7325
Telephone: (004) 42 2247
Fax: (004) 42 2623
 Owner/Chief Instructor: John Griffiths.
 Certification: PADI.
 Courses Offered: Snorkel, open water, advanced, rescue, medic, Divemaster, instructor, specialties, photography, deep, night, search and recovery.
 Full time, part time courses and equipment supplied.
 Cost Per Course: Basic \$295; Advanced \$240.
 Dive charter available, dive club and newsletter.
 Services Available: Test station, equipment service, sales, hire, dive holidays.
 Comments: In-house heated pool, two charter boats, open seven days.



PADI

Southern Tasmanian Divers
212 Elizabeth Street,
Hobart Tas 7000
Telephone: (002) 34 7243
 Chief Instructor: Mark Ransley.
 Certification: PADI/FAUI.
 Courses Offered: To master diver.
 Full time courses and equipment supplied.
 Cost Per Course: Basic: PADI \$240, FAUI \$280; Advanced \$100 to \$200.
 Dive charter available, dive club and newsletter.
 Services Available: Sales, equipment, servicing all reg gauges etc.
 Comments: ASA Test Station 217.

VICTORIA

a.b. Ocean Divers

237 East Boundary Road,
East Bentleigh Vic 3165
Telephone: (03) 579 2851
Fax: (03) 563 8594

Owner/Chief Instructor: Warrick McDonald/Jane Bowman.

Certification: PADI.

Courses Offered: Entry level to instructor, medic first aid instructor.

Full time, part time courses and equipment supplied.

Cost Per Course: Basic \$380; Advanced \$200.

Dive charter available, dive club and newsletter.

Services Available: Retail sales of scuba equipment, full equipment servicing, group holidays (interstate and overseas), air fills.

Comments: PADI 5-Star centre.



Associated Divers

1292 Centre Road,
Clayton Vic 3168
Telephone: (03) 544 9002

Owner/Chief Instructor: Graeme Smith.
Certification: Master Instructor FAUI.

Courses Offered: All FAUI courses to assistant instructor.

Full time, part time courses and equipment supplied.

Cost Per Course: Basic \$395; Advanced \$260.

Dive charter available, dive club and newsletter.

Services Available: Sales, expert equipment service including cylinder testing, travel adventures, diving education, exhilarating dive charters.

Bob Cumberland's Dive Shop

1 Humpshire Road,
Glen Waverley Vic 3150
Telephone: (03) 560 3610
Fax: (03) 562 0503

Owner/Chief Instructor: Bob Cumberland.

Certification: FAUI.

Courses Offered: Basic, advanced, specialty courses, general interest and hobby courses.

Full time, part time courses and equipment supplied.

Cost Per Course: Basic \$415; Advanced \$190.

Dive charter available, dive club and newsletter.

Services Available: Sales, equipment service, dive charters, travel, equipment hire.

Dive Experience

82-84 Ferguson Street,
Williamstown Vic 3016
Telephone: (03) 397 5139
Fax: (03) 397 2693

Owner/Chief Instructor: John Marks.

Certification: FAUI/NAUI.

Courses Offered: Basic open water, master diver, Divemaster, cave diver. Full time courses and equipment supplied.

Cost Per Course: Basic \$250.

Dive charter available, dive club and newsletter.

Services Available: Sales, equipment service, travel, hire gear, air fills, boat charters, scuba instruction.

Dive Inn

1/73 Bedford Road,
Ringwood Vic 3153
Telephone: (03) 879 4988
Fax: (03) 879 4939

Owner/Chief Instructor: Kevin Massey.
Certification: PADI/FAUI.

Courses Offered: All levels.

Full time, part time courses and equipment supplied.

Cost Per Course: Basic \$400.

Dive charter available, dive club and newsletter.

Services Available: Sales, hire, service, tank testing, Australian and overseas travel, dive charters, snow ski hire (winter).

Comments: Active social club.



Geelong Dive Centre

146 Ormond Road,
East Geelong Vic 3219
Telephone: (052) 21 3342

Owner/Chief Instructor: Graham Stephens.

Certification: NAUI.

Courses Offered: Open Water 1 through to Divemaster, cave diving, deep wreck, photographic.

Full time, part time courses and equipment supplied.

Cost Per Course: Basic \$310; Advanced \$250.

Dive charter available, dive club and newsletter.

Services Available: Sales, equipment service, travel, salvage and commercial work.

Comments: We also have a 46 foot cutter/ketch yacht offering sail, dive, snorkel cruises.



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580 Victoria Street,
North Melbourne Vic 3051
Telephone: (03) 328 3217
Fax: (03) 326 5343

Owner/Chief Instructor: Steve Sinclair.
 Certification: NAUI.

Courses Offered: Entry level to instructor.

Full time, part time courses and equipment supplied.

Dive charter available, dive club and newsletter.

Services Available: Full professional dive store services provided.

Comments: Victoria's leading dive school since 1977.

Interdive Australia
242 Burwood Highway,
Upper Ferntree Gully Vic 3156
Telephone: (03) 758 8333
Fax: (03) 752 2801

Owner/Chief Instructor: Geoffrey Sparkes.

Certification: PADI.

Courses Offered: Open water, advanced open water, medic first aid, rescue diver, Divemaster, deep, research, search and salvage and equipment, navigation, discover scuba.

Full time, part time courses and equipment supplied.

Cost Per Course: Basic \$300; Advanced \$190.

Dive charter available, dive club and newsletter.

Services Available: Full service dive store offers equipment for sale or hire, air fills, travel, social dive club, travel, holidays, tailor-made wetsuits, apne dive clothing.

Comments: Two fully surveyed boats.

Kiwi Dive
95 Betula Avenue,
Vermont Vic 3133
Telephone: (03) 874 7630
Fax: (03) 878 1882

Owner/Chief Instructor: Terry Pedersen.

Certification: FAUI.

Courses Offered: Basic, advanced.

Full time, part time courses and equipment supplied.

Cost Per Course: Basic POA; Advanced POA.

Dive charter available.

Services Available: Equipment hire, service and sales, air fills, charters arranged.

Comments: An independent scuba instruction school providing personalised service.



Marlo Dive Sales & Hire
Burbang Caravan Park,
Burbang Road,
Cape Conran Vic 3888
Telephone: (051) 54 8219

Owner/Chief Instructor: Peter Hall.

Certification: PADI.

Courses Offered: Open water to assistant instructor.

Full time, part time courses and equipment supplied.

Cost Per Course: Basic \$320; Advanced \$200.

Services Available: Sales, hire, service, air fills, camp park.

Comments: Five minutes to ocean boat ramp with access to Beware Reef.

Melbourne Diving Services
3755 Nepean Highway,
Port Sea Vic 3944
Postal Address:

144 Bell Street,
West Heidelberg Vic 3081
Telephone: (03) 459 4111
Fax: (03) 459 9942

Owner/Chief Instructor: Brian Williamson.

Certification: PADI.

Courses Offered: Open water, advanced, rescue, medic first aid, night diver, wreck diver, deep, master diver, Divemaster, instructor.

Full time and part time courses.

Cost Per Course: Basic \$295; Advanced \$195.

Dive charter available, dive club and newsletter.

Services Available: Service, training, dive charter, sales, hydro test station, travel.

Paradise Divers
114 Carlton Road,
Dandenong Vic 3175
Telephone: (03) 793 5248

Owner/Chief Instructor: Terence J. Oakley.

Certification: PADI.

Courses Offered: All specialty and advanced diver education courses.

Full time, part time courses and equipment supplied.

Cost Per Course: Basic \$300; Advanced \$220.

Dive charter available, dive club and newsletter.

Services Available: Sales, equipment service, travel, air fills, training and cup of tea.

Port Albert Dive Centre
Tarraville Road,
Port Albert Vic 3971
Telephone: (051) 83 2401
Fax: (051) 83 2511

Owner/Chief Instructor: Dick Whitaker.

Certification: SSI.

Courses Offered: Entry level.

Full time and part time courses.

Cost Per Course: Basic \$380.

Dive charter available and newsletter.

Services Available: Sales, equipment service, training, air fills, charter for Wilson's Promontory.

Comments: We are a small operation servicing the Latrobe Valley region of Gippsland, Victoria.

Professional Diving Services
113 Bentinck Street,
Portland Vic 3305
Telephone: (055) 23 6392
Fax: (055) 21 7255

Owner/Chief Instructor: Frank Zeigler.

Certification: NAUI.

Courses Offered: Snorkel diver through to and including instructor, cave diving courses a specialty. Also deep, wreck, kelp.

Full time courses and equipment supplied.

Cost Per Course: Basic \$350; Advanced \$390.

Dive charter available, dive club and newsletter.

Services Available: Hydrostatic test station, fast, clean air fills stored at 330 bar, 8.4 metre shark cat with Volvo diesels for fast, comfortable and safe diving.

Comments: Visit beautiful Lawrence Rocks, dive the kelp forest, play with the seals or dive some of our wrecks. Dive Julia Percy Island, Cape Nelson or Cape Bridgewater.



Queenscliff Dive Centre
37 Leurmonth Street,
Queenscliff Vic 3225
Telephone: (052) 52 1188
Fax: (052) 52 3273

Owner/Chief Instructor: Steve Sinclair.

Certification: NAUI.

Courses Offered: Entry level to instructor.

Full time, part time courses and equipment supplied.

Dive charter available, dive club and newsletter.

Services Available: Full professional dive store services.

Comments: On site indoor heated training pool.

Sea-Studies Services
70 Railway Parade South,
Chadstone Vic 3148
Telephone: (03) 807 0773
Fax: (03) 807 8483

Owner/Instructors: Reg and Kay Lipson.

Certification: PADI/FAUI/NAUI AND SSI.

Courses Offered: Marine life studies programs. Many different programs are offered.

Part time courses and equipment supplied.

Cost Per Course: Basic \$300; Advanced — varies according to program and location around Australia.

Dive charter available.

Services Available: Marine life studies program. We are not a retail outlet.



Springvale Dive Centre
131 Springvale Road,
Springvale Vic 3171
Telephone: (03) 546 0905

Owner/Chief Instructor: Andrew Klimek.

Certification: PADI.

Courses Offered: Open water to Divemaster.

Part time courses and equipment supplied.

Cost Per Course: Basic \$330; Advanced \$240.

Dive charter available and dive club.

Services Available: Sales, equipment service, travel, scuba pro specialist.

Tasy's Dive Shop
Lashin Street,
Inverloch Vic 3996
Telephone: (056) 74 1848

Owner/Chief Instructor: Tas Silcock.

Certification: PADI.

Courses Offered: Open water dive advanced, Divemaster, deep wreck, night, cave diver.

Full time courses and equipment supplied.

Cost Per Course: Basic \$300; Advanced \$180.

Dive charter available, dive club and newsletter.

Services Available: Sales, equipment service, hire, tank testing.

Comments: New shop opening on Philip Island soon.

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**237 East Boundary Road,
East Bentleigh 3165 Ph: 579 2851**

Western Diving Services
227 Nelson Place,
Williamstown Vic 3016
Telephone: (03) 397 6045
Fax: (03) 397 6244

**559 Mt Alexander Road,
Moonee Ponds Vic 3039**
Telephone: (03) 370 9258

Owner/Chief Instructor: John Poelnikk.
Certification: NAUI.
Courses Offered: Open water 1, Open water 2, advanced, rescue, Divemaster, assistant instructor.
Full time, part time courses and equipment supplied.
Cost Per Course: Basic \$300; Advanced \$320.
Dive charter available, dive club and newsletter.
Services Available: Sales, service travel, on site hydro testing, compressor hire, air fills.



Wetsports
14 Bridge Mall,
Ballarat Vic 3350
Telephone: (053) 31 7277
Fax: (053) 32 8566

Owner/Chief Instructor: Len Salter.
Certification: SSI/PADI.
Courses Offered: Open water, advanced, specialties, dive control specialist instructor.
Full time courses and equipment supplied.
Cost Per Course: Basic \$295; Advanced \$260.
Dive charter available, dive club and newsletter.
Services Available: Sales, equipment and clothing, hire, tank hydro station, full servicing all equipment, travel, charters.

WESTERN AUSTRALIA

Busselton Dive 'N Surf
99 Queen Street,
Busselton WA 6280
Telephone: (097) 52 2096
Fax: (097) 52 2096

Owner/Chief Instructor: Simon Treloar.
Certification: FAUI.
Courses Offered: Basic, advanced, selected specialty units.
Full time, part time courses and equipment supplied.
Cost Per Course: Basic \$240; Advanced \$120.
Dive club and newsletter.
Services Available: Sales, equipment service, hire gear, travel.

David Budd Watersports
3 The Plaza, Mandurah WA 6210
Telephone: (09) 535 1520
Fax: (09) 581 4987
Owner/Chief Instructor: David Budd.
Certification: PADI.
Courses Offered: Open water, advanced, specialties, Divemaster, photography.
Full time courses and equipment supplied.
Cost Per Course: Basic \$295; Advanced \$150.
Dive charter available, dive club and newsletter.
Services Available: Rowley Shoals charter, Maldives, full rental, servicing available.
Comments: WA's specialist underwater photography centre.

Dive Ski and Surf
413 Hay Street,
Subiaco WA 6008
Telephone: (09) 381 2480
Fax: (09) 388 1602
Chief Instructor: Denise Cheir.
Certification: NAUI.
Courses Offered: OWI, instructor training course.
Full time, part time courses and equipment supplied.
Cost Per Course: Basic \$260; Advanced — Modules \$200.
Dive charter available, dive club and newsletter.
Services Available: Hire equipment, retail sales equipment service, air fills, tank testing, instruction, travel, charter boats, school camps, adventure weekends, NAUI instructor trainer on full time staff.
Comments: 21 years old this year — biggest and oldest dive store in WA.

Divers Hire and Supply
71A Stirling Highway,
North Fremantle WA 6159
Telephone: (09) 335 9097
Fax: (09) 335 9097
Owner: Rod Angus.
Certification: FAUI.
Courses Offered: Basic to Divemaster, assistant instructor.
Part time courses and equipment supplied.
Cost Per Course: Basic \$250; Advanced POA.
Dive charter available, dive club and newsletter.
Services Available: Sales, service on all equipment for recreational and professional diving.
Comments: Owner is professional commercial diver, with own commercial diving company (Diving Services WA).

Diving Ventures
384 South Terrace,
Fremantle WA 6162
Telephone: (09) 336 1664
Fax: (09) 430 5641

Owner/Chief Instructor: Peter Hall and Ed Izydorski.

Certification: PADI.

Courses Offered: Open water, advanced open water, rescue, Divemaster.

Full time, part time courses and equipment supplied.

Cost Per Course: Basic \$395; Advanced \$295.

Dive charter available, dive club and newsletter.

Services Available: Sales, equipment hire, service, travel, one day dive tours.

Frog Dive Scuba Centres
222 Main Street,
Osbourne Park WA 6017
Telephone: (09) 344 5545
Fax: (09) 344 5334

Owner/Chief Instructor: Brian Blake and Ian Smith.

Certification: NAUI.

Courses offered: All courses to instructor level.

Full time, part time courses and equipment supplied.

Dive charter available, dive club and newsletter.

Services Available: Equipment sales, servicing, full instruction, club facilities and discount.



Malibu Diving
43 Rockingham Road,
Rockingham WA 6168
Telephone: (09) 527 9211
Fax: (09) 527 5892

Owner/Chief Instructor: Steve Sturgeon.

Certification: SSI.

Courses Offered: Open water, advanced open water, dive control specialist, deep, night, wreck, photography, stress/rescue, underwater life, equipment, boat, navigation, search and recovery.

Full time, part time courses and equipment supplied.

Cost Per Course: Basic \$275; Advanced \$195.

Dive charter available, dive club and newsletter.

Services Available: Sales all top brands, service all makes, gear (retail and wholesale), hydro test station SAA 221 (breathing mechanics), boat dives four trips daily MV Liberator, Bali dive safaris and local and overseas travel, SSI instructor training facility, dive club discounts, top quality hire gear never more than six months old — Seaquest, Sherwood and Dacor.



Pace Sports
189 Marine Terrace,
Geraldton WA 6530
Telephone: (099) 21 4229
Fax: (099) 64 2229

Owner/Chief Instructor: Trevor Beaver. Certification: FAUI.

Courses Offered: Basic, advanced, equipment specialist, night diver, diver lifesaver.

Full time courses and equipment supplied.

Dive charter available, dive club and newsletter.

Services Available: Air fills, repairs, rental, cylinder testing, fish equipment, sales, repairs.

Perth Diving Academy
283 Wanneroo Road,
Nollamara WA 6061
Telephone: (09) 344 1562
Fax: (09) 344 7844

Owner/Chief Instructor: Simon Jones and Hugh Morrison.

Certification: FAUI. Courses Offered: Scuba diver, equipment specialist, deep diver, night diver, recovery diver, diver lifesaver, advanced Divemaster, one star instructor, two star instructor.

Full time, part time courses and equipment supplied.

Cost Per Course: Basic \$245; Advanced \$95 to \$125.

Dive charter available, dive club and newsletter.

Services Available: Hydrostatic tests in shop, regulator services, equipment sales, overseas holidays, own charter boat.

Comments: Shop has indoor heated pool for diving instruction. Open seven days a week.



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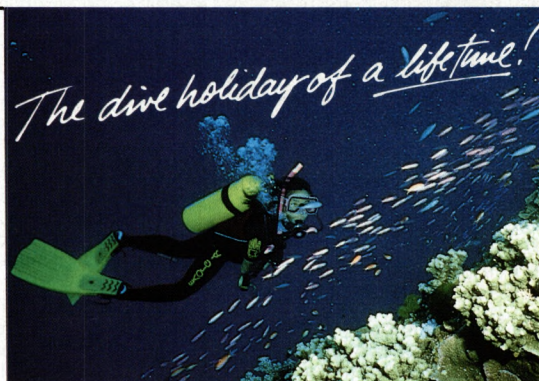
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NEW GUINEA DIVING

Papua New Guinea's lush coral reefs, fed by minerals from rich volcanic soil, and its deep, wrecks make it one of the most sought after dive destinations in the world.

Text and photographs by Andrew Green and H. Gert de Couet

New Guinea has consistently proven to be one of the most diverse, prolific and interesting destinations for divers. The waters between the island of Papua New Guinea and the southern Philippines exhibit the world's highest density and number of different species of marine animals, almost as if this area was the evolutionary melting pot from which nature recruited the most successful life forms.

In geological terms, the region is literally a melting pot where huge parts of the outer crust of the earth collide here, forming deep sea trenches or pushing up chains of innumerable islands with high, rugged mountain ranges and active volcanoes as evidence of the underlying plate tectonics. Volcanic soil promotes the growth of dense, lush tropical forests, fed by rain clouds borne by trade winds. Some of the fertilizing minerals are washed into the sea.

These mineral fertilizers form the basis of the richest coral reef communities known in the Pacific, supporting the growth of microscopic algae that is food for sponges, small crustaceans and planktonic organisms which in turn provide the food for coral polyps and many coral fishes.

The constant geological activity of the region rapidly creates islands that develop fringing reefs within a few hundred years. In some areas, entire reefs and parts of the ocean floor are lifted out of the water. In other regions islands sink just as rapidly back into the sea, leaving ring-shaped coral atolls behind to mark the outlines of islands that may have existed only a few million years ago. Correspondingly, some parts of New Guinea offer shallow water reefs and sheltered lagoons, whereas others exhibit underwater landscapes as rugged and wild as the mountainous islands surrounding them.

The best diving in New Guinea is found along its northeastern coast, between Madang and Milne Bay, and around the New Britain and New Ireland island archipelago. No doubt many interesting islands and reefs will not be dived for years to come because of their remote location and lack of accommodation and travel facilities. Accessibility and infrastructure are the main limiting factors as far as remote dive locations are concerned. At the time of writing, land-based diving facilities exist in Madang, Salamaua (Lae), Rabaul, and Kimbe (Wahindi).

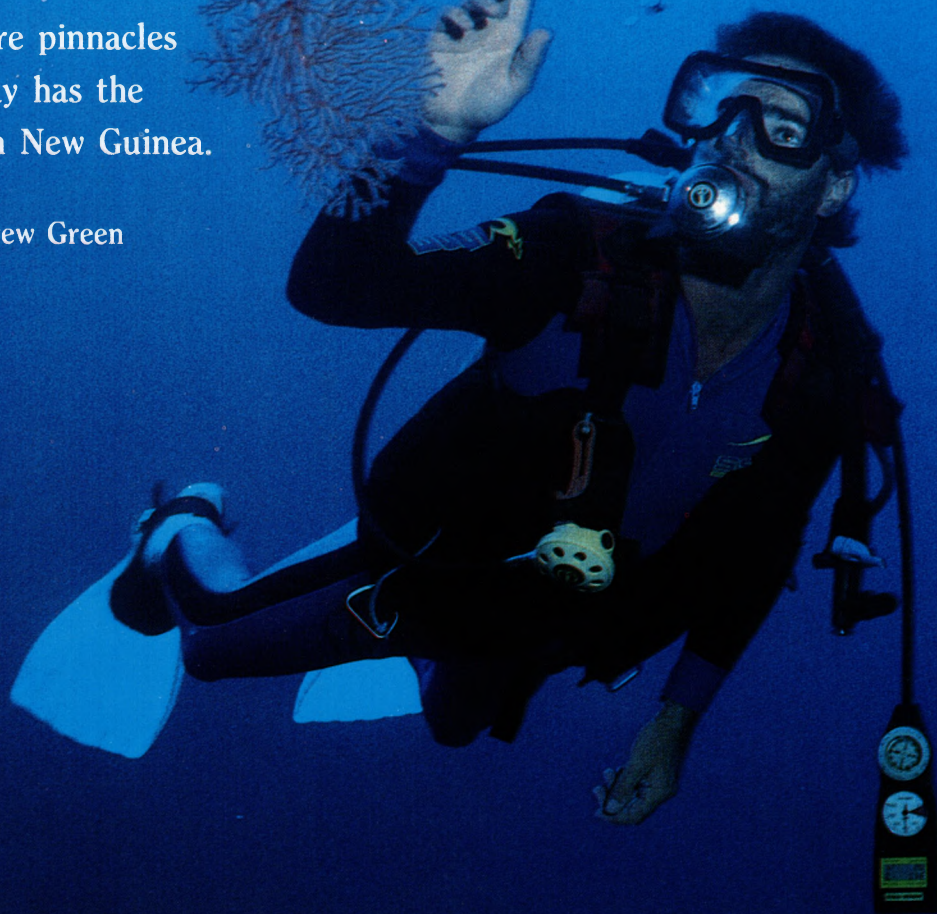
In this issue, Wahindi and Rabaul are featured. An article on live-aboard diving in Milne Bay on the *Telita* will run in the October/November 1990 issue of *Scuba Diver*.

Andrew Green and Gert de Couet are field editors for Scuba Diver, frequently contributing marine biology, underwater photography, wreck diving and dive travel articles. Although this was a first trip for them to Wahindi, both have dived New Guinea extensively over the years and could be termed as PNG fanatics.

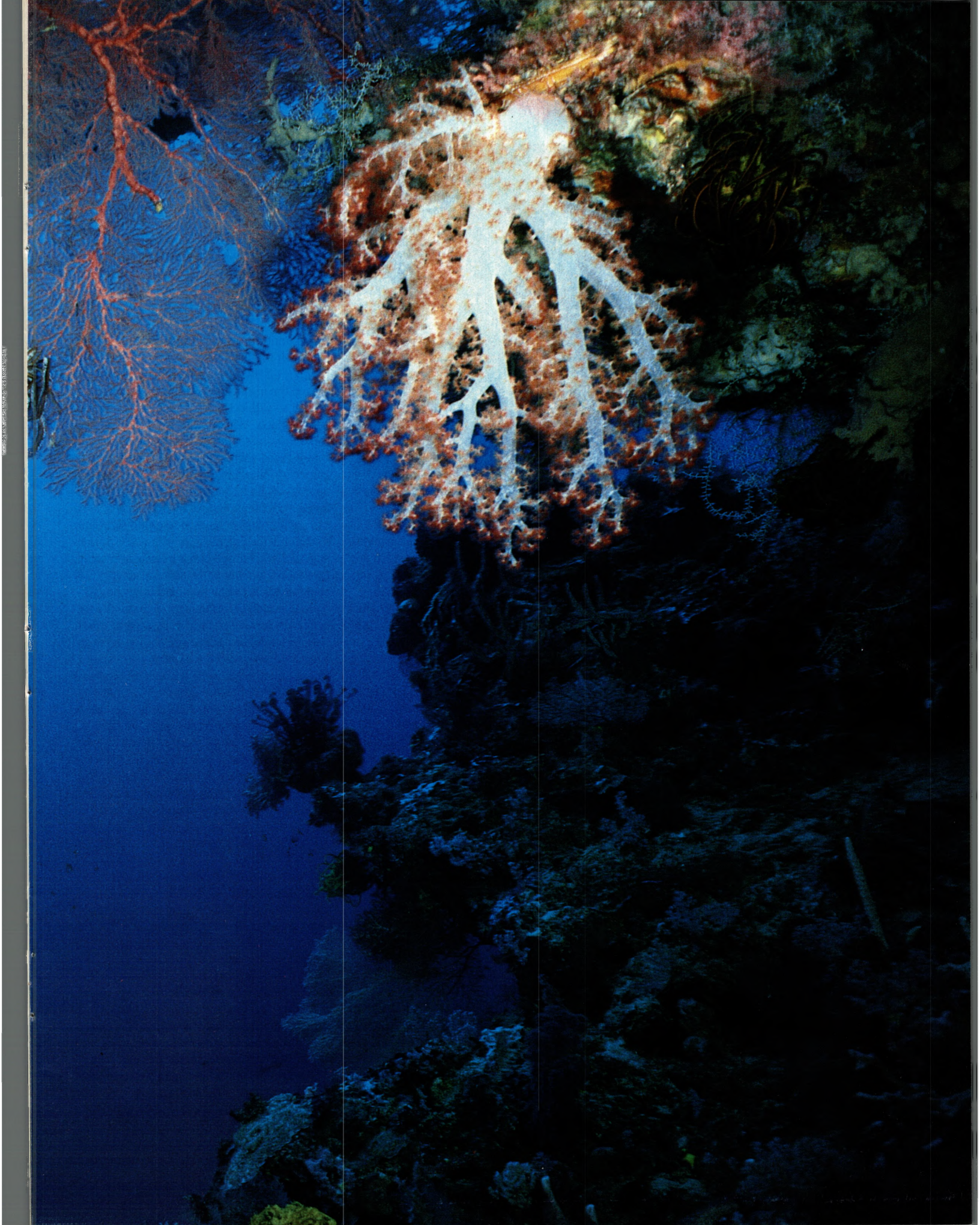
The CORAL GARDENS

With fringing reefs, offshore pinnacles and small atolls, Kimbe Bay has the finest shore-based diving in New Guinea.

Text and photographs by Andrew Green and H. Gert de Couet



Walindi instructor, Philip Munday, examines gorgonians and soft corals in the mouth of the cave at North Emma Reef.



THE CORAL GARDENS *continued*

Walindi Plantation has become synonymous with Kimbe Bay diving. Kimbe is a small provincial town situated on the western coast of New Britain at the fringe of a bay formed by the Willaumez Peninsula. The nearest town is Hoskins with an airport and daily connections to Port Moresby, Lae and Rabaul.

Located on the crest formed by two colliding plates lie New Britain and the adjacent islands, northwest of the New Ireland deep sea trench. Several occasionally active or recently extinct volcanoes are present throughout the archipelago.

When the world copra market collapsed and planters in New Guinea were forced to look for alternative business ventures, Max Benjamin, owner of Walindi Plantation, converted part of his property into a dive resort. At first, he says, he didn't realise what he had actually started. It was only when internationally renowned underwater photographers, such as Chris Newbert (of *Within a Rainbowed Sea* fame), kept coming back for more that he realised one of the world's best dive locations was right on his doorstep. Kimbe Bay can modestly be described as the best shore-based diving presently available in New Guinea.

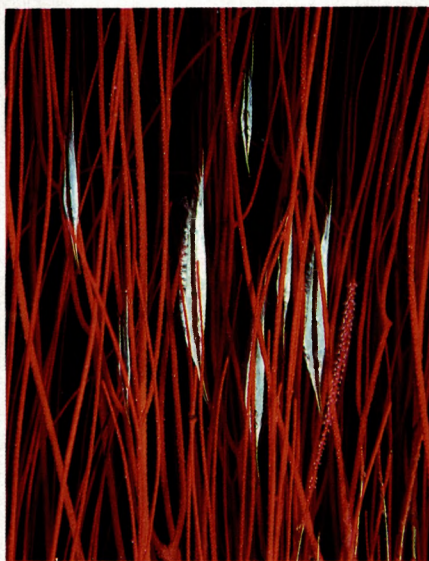
The geographical peculiarity of the Willaumez Peninsula protects the bay from the predominant southeast trade winds and, in combination with the influx of nutrients from



A curious whip goby perched on a sea whip on North Ema Reef eyes the photographer.

small streams, allows an unrivalled coral growth. There is a system of inshore fringing reefs and several offshore pinnacles and small atolls, with characteristic steep dropoffs and deep saddles. Many of them have fissures and clefts exhibiting overhangs and caves.

There is no apparent reason for the particularly prolific growth of soft corals, gorgonians and leather corals around Kimbe Bay, which are characteristic of this region. Usually, these corals are only found in areas with high cur-



This whip gorgonian on Susan's Reef is home to a small school of razor fish.

rent action. In addition, large basket sponges and light blue elephant ear sponges, which are also found in other areas of New Britain and New Ireland, are common in Kimbe Bay.

It is no coincidence that many award-winning underwater images have been taken in the clear waters of Kimbe Bay. The regular visitor to Walindi probably recognises the sea fans of Vanessa's Reef (there is a clear preference for female dive instructors' names being immortalised on the local sea chart) or Kimbe Island in many published pictures.

Max Benjamin is proud of the fact that many of the winning pictures from the prestigious South Pacific Divers Club competitions over the past four years were taken in "his" diving territory. Prints of some of these shots decorate the walls of the dining room at Walindi, reminding you that you are in good company if you are into underwater photography. The number and quality of these images may be rather humbling for budding underwater photographers, but then again, you will have no excuse for not producing similar pictures yourself.

This area is definitely wide-angle lens country, and we advise you to leave your macro equipment behind. It is not to say that there is a lack of suitable subjects, but merely to point out that you are going to find it difficult trying to concentrate on microscopic subjects when you are diving amid giant sea fans, pink soft corals and crimson gorgonians, some of which must be world records for their size. You may also miss out on seeing the occasional school of hammerhead sharks. Yes, you will also see sharks, tuna, and trevally, and barracudas are regular visitors to the reefs. In an aesthetic sense, the term "coral gardens" aptly describes

Kimbe Bay diving and the underwater landscapes.

A special attraction is diving among dolphins and several small-toothed whales, such as pilot whales and even orcas (seen on one occasion). These encounters can be virtually guaranteed for anyone spending a week or so in Walindi. Marine mammals are plentiful throughout the year in Kimbe Bay and readily approach the dive boat. Divers just grab hold of ropes off the bow as the boat moves slowly around the mammals. You can see dolphins approach to within touching distance at breath-taking speed. With a little bit of confidence, you may even get the chance to take a picture.

Organised shark feeds, which are a regular attraction in other dive resorts, are frowned upon in Walindi as unnatural because they interfere with the ecology of the reef. Instead, you can try the daring sport of jumping right into a school of feeding pelagics with your snorkelling gear and behave like a trevally in trouble. Invariably, a number of silvertip sharks will come in for a closer look within seconds.

On one such occasion, a group of three mantarays in formation circled us several times. Murphy's rule for underwater photography applied: both of us were equipped with cameras and standard lenses while a 1.4-metre wingspan animal approached to within arm's length before it decided we were too big for plankton.

Some of the most interesting dive sites are rather deep, 30 to 40 metres. If you're a beginner, you would be well advised to gain some experience before you come here in order to get the most out of your dives. Safety stops are quite enjoyable after a wall dive because you can slowly ascend to coral gardens that often extend to within a few feet of the surface on some dive sites.

If you're into serious macro photography, we can assure you that Kimbe Bay is also a "prong-pokers paradise". A comprehensive list of available nudibranchs can be supplied by the authors, and the number of coral species fills a three-volume monograph.

The main dive boat, *Ema* is a 7.5-metre Star boat powered by a 200 hp Volvo-Penta diesel. *Ema* can accommodate up to 10 divers. In addition, a 6-metre outboard-powered Yamaha boat is available to assist with larger groups or for the specific requirements of beginners.

Since the most interesting dive sites are up to 30 kilometres from the plantation, dive trips leave the jetty shortly after breakfast and return in the early afternoon. Because of the sheltered waters, cruising across the bay is relaxing and scenic. A sumptuous picnic lunch is provided ►

Sea whips line the saddle bommie at North Emma Reef.



THE CORAL GARDENS *continued*



Accommodation at Walindi Plantation is in self-contained, thatched bungalows set in tropical gardens.



While photographing crinoids and sea whips at 28 metres, a massive school of barracuda formed flowing shapes encircling the diver in the background.

to keep you going for at least two dives.

The number of dives offered is limited by the total number of tanks that can be stored on the boat (24). Therefore, smaller dive groups may have the chance to do three dives per day. Even helicopter diving is available, at extra cost, to visit truly undived reefs in style!

All dive gear is available for hire, such as modern Sherwood regulators and TUSA Liberator ADVs. There are three Bauer compressors of 14, 5 and 3.5 cubic foot capacity.

As a fanatic diver, your main interest will probably be the underwater scenery of Kimbe Bay. However, we find the accommodation and atmosphere at Walindi equally worth noting. We agree with the reader survey from the American magazine, *In Depth*, which voted Walindi as equal (with two others) for the "best diving at a resort in the rest of the world" (i.e., excluding the Caribbean).

Self-contained bungalows built in traditional island style are located near the shore where

TRAVEL INFORMATION FOR WALINDI AND RABAUL

Currency: The currency is the kina (K); 100 toea to a kina. Travellers cheques in US or Australian dollars acceptable.

Credit cards: American Express seems widely accepted; Diners also accepted by larger establishments. Bankcard and Mastercard not accepted anywhere, although it is rumoured the latter is to be introduced soon.

Climate: The official wet season is December to April (variable) for New Britain and New Ireland. May to November is therefore the best time to dive Walindi and Rabaul. However, there is no guarantee that it won't rain during the dry season, nor that diving conditions won't be excellent outside this time. Offshore reefs are relatively unaffected by rainwater runoff. Even during the rainy season, the clouds tend to move in during the afternoon.

Average temperature: 24-31 degrees Celsius. Lycra suit or 3mm wetsuit adequate for warmth and recommended for protection against coral cuts, abrasions or stingers.

Travel: As a general precaution, whenever you travel overseas, we recommend you label all baggage, and after you check in, if possible, watch for it to be loaded on to the plane. This is easy to do at PNG internal airports. Baggage allowance on an Air Niugini international ticket is generous: 20kg plus 15kg of sporting equipment (i.e. dive gear) per person; even a photographer can just about get by on this. We packed much of our gear in dive tubs (lidded fish boxes), finding them handy for camera gear at dive destinations.

Health: Malaria is endemic in much of New Guinea and some form of malaria prophylaxis is highly recommended, such as chloroquin, maloprim, fansidar, or lariam. You should consult a doctor as some of these drugs require a prescription and a strict dosage regime after you return from the trip.

they always receive a gentle, cooling sea breeze. The bungalows have ample hot and cold water. In addition, they are equipped with fans, refrigerator and coffee-making facilities with real New Guinea coffee.

Meals and breakfast are served in a common dining room, next to the freshwater pool and bar. Entertainment includes TV, video, an extensive library and plenty of stimulating conversation.

Apart from diving, Kimbe Bay also offers a number of other attractions. Talasea, a village near Walindi, has repeatedly been the focus of attention from anthropologists around the world because some of the oldest pottery artefacts in PNG have been found in this region (Lapita pottery). Some of the archaeological sites are within driving distance of Walindi, as are missions, World War II plane wrecks, hot springs, geysers and other remnants of volcanic activity. Tours can be organised from the resort.

Of course, snorkelling, tennis, golf and wind-surfing are available free, and fishing trips can be arranged (reef or freshwater hinterland). Walindi Plantation is an ideal holiday destination if your partner is not an enthusiastic diver.

On the romantic side, the famous firefly-tree of the plantation deserves mentioning at this point. Picture a warm, dark tropical night, frangipani scent wafting through the air, and a tree festooned with hundreds of tiny points of light, flashing some primitive message in unison under the stars . . .



Commonsense dictates prevention is better than cure, so wear long-sleeved shirts in the evenings and use insect repellent and mosquito nets. Medical assistance is available in all provincial capitals.

It is essential to use sunscreen all the time to prevent sunburn and minimise the risk of skin cancer since you are exposed to the equatorial sunlight in addition to the light reflected by the sea.

Souvenirs: a large range of traditional carvings, shell jewellery and pottery from all over Papua New Guinea can be obtained from PNG Arts, in Hohola, Port Moresby. There is also an excellent artefact shop in Rabaul. Check out the fire dance masks. Both shops will happily pack and even freight artefacts for you.

Traps: The Rabaul power supply (nominally 240 volts AC), or more precisely, the interruptions and power surges. We had two nicad battery chargers burn out in five minutes. We strongly recommend photographers bring strobes or movie lights that can use alkaline or nicad packs, and/or a 12 volt battery charger (you can always find a car battery somewhere). Alkaline batteries and most other supermarket goods are readily available. (Incidentally, dive gear is generally cheaper than in Australia.) We had no trouble with the power supply at Walindi, where the plantation generator operates from 6 am to midnight (also 240 volts AC). In more remote locations, however, generators may only supply energy during limited hours.

Political climate: PNG has been under the media spotlight recently because of the unrest in Bougainville. However, Bougainville is a long way from Rabaul or Walindi, and the circumstances are totally different. Rabaul, too, doesn't seem to suffer the same crime problems as Port Moresby; unlike the latter cities, it is safe for males at least to walk around Rabaul at night (similar to Australia). We recommend you ask your travel agent to minimise stopovers in Port Moresby, although there is also good diving there. To be fair, we found the people, without exception, friendly and helpful wherever we went.

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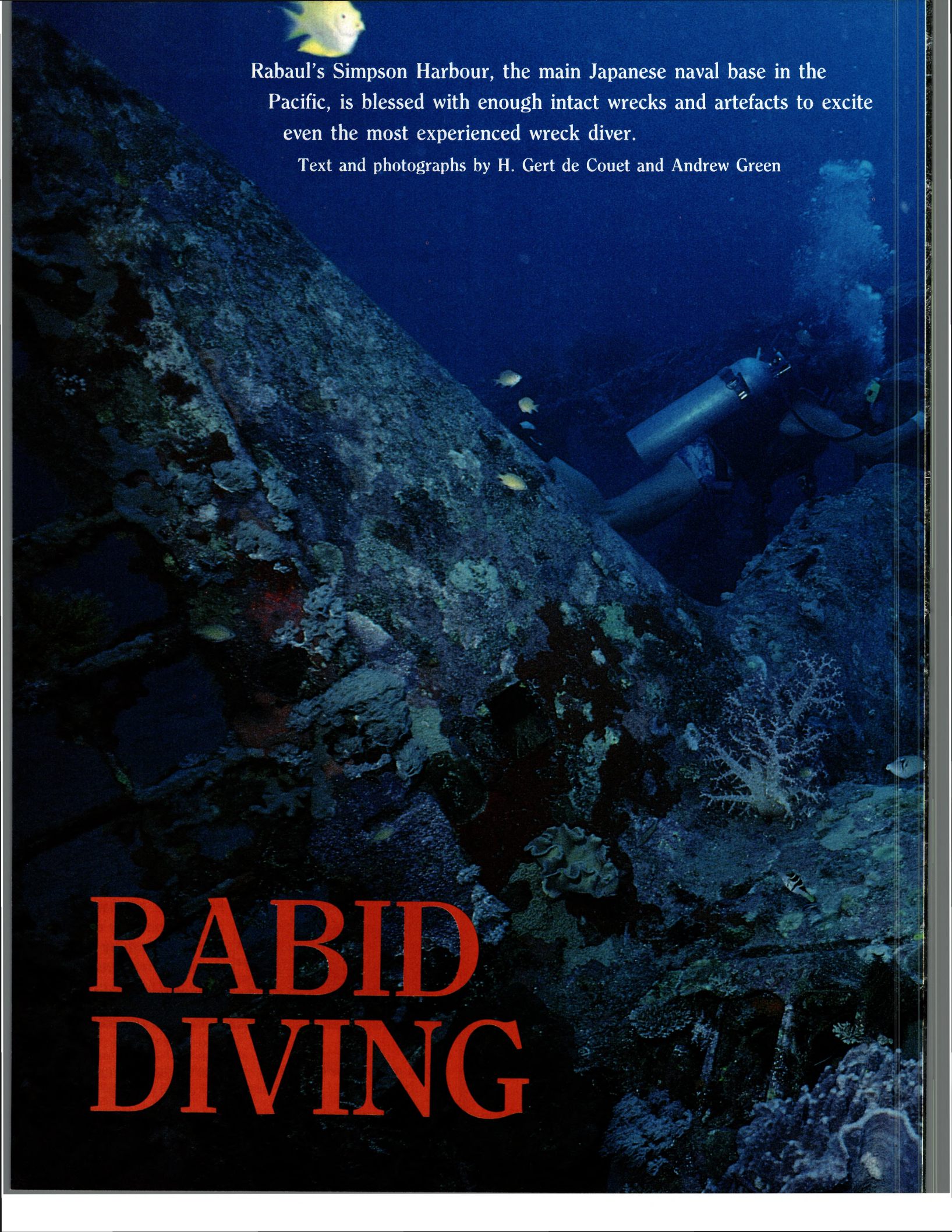
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A full-page underwater photograph serves as the background. It depicts a diver with a silver tank and a light on their head, positioned on the right side of the frame. The diver is looking towards a large, dark, and heavily encrusted metal structure that dominates the left and center of the image. This structure appears to be a shipwreck, with various mechanical parts and debris visible. The water is a deep blue, and several small, yellowish fish are scattered throughout the scene. The overall atmosphere is one of exploration and discovery.

Rabaul's Simpson Harbour, the main Japanese naval base in the Pacific, is blessed with enough intact wrecks and artefacts to excite even the most experienced wreck diver.

Text and photographs by H. Gert de Couet and Andrew Green

RABID DIVING



A two-seater Mitsubishi bi-plane, used for reconnaissance by the Japanese during WWII, lies in about 27 metres outside the Rabaul Harbour, decorated with soft corals and crinoids.

Wreck diving is a strange affliction. Those infected spend vast amounts of time and money to examine man-made objects, often in an advanced state of decay and sometimes barely recognisable in the gloomy depths.

These same hulks usually excite little interest while on or above the water, yet put them at an appropriate depth, complete with a few artefacts, and they can become "holy grails" of diving worth risking life and limb to visit.

Why? What makes a ship, aeroplane or other wreck suddenly more attractive once it has started to rot and is hard to reach? Is it an appeal to baser instincts?

We aren't knocking the passion since we suffer more than a passing dose ourselves. But, to explain it to a non-diver is near impossible. Part kleptomania, part sheer bloody mindedness when the dive is difficult or dangerous, and part watching the natural world take an artefact unto itself.

Australia is blessed with lots of shipwrecks, but not many are in that delightful state of transition somewhere between freshly sunk and despairingly ransacked. That's the beauty of places like Rabaul, which is on the island of New Britain in Papua New Guinea.

For a time during World War II, Rabaul's Simpson Harbour was the main Japanese naval base for the Pacific. When the course of the war changed, many Japanese vessels were sunk in and around the harbour. Most are too deep for sportdivers, but of those that are accessible, many are intact and sporting heaps of goodies (for looking at, NOT nicking!).

Rabaul Diving Center, or Rabdive for short, runs charters to the wrecks daily at 9 am and 2 pm. Rabdive is owned by Max Benjamin (who also operates the dive resort at Walindi), and Frank Butler. Instructor Steve Philp was in charge during our stay. If any of our readers are in their thirties or older and have sometimes wistfully wondered what it would be like to be 22 or so again, but knowing what you know now . . . Well, Steve is that age and does have that knowledge. We coined the term "rabid diving" to try to describe the infectious enthusiasm for diving and life in general shown by Steve.

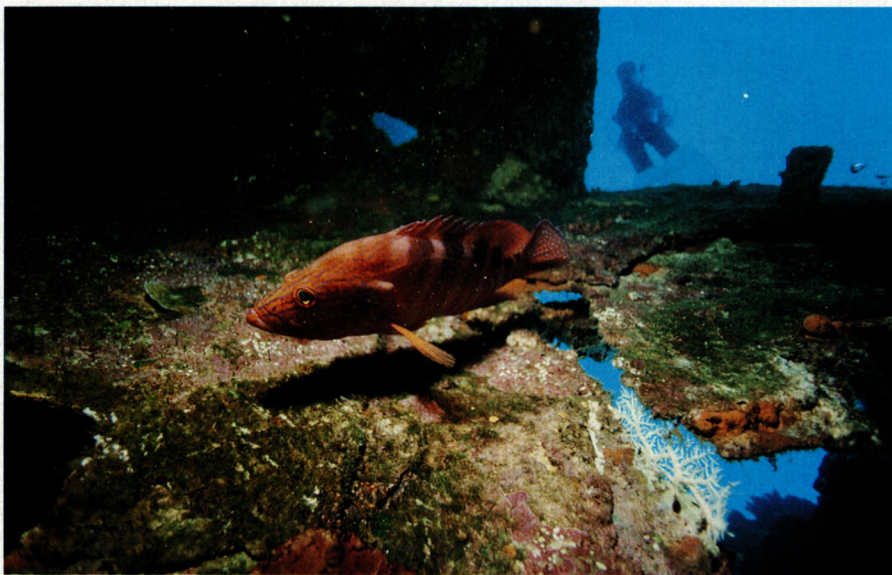
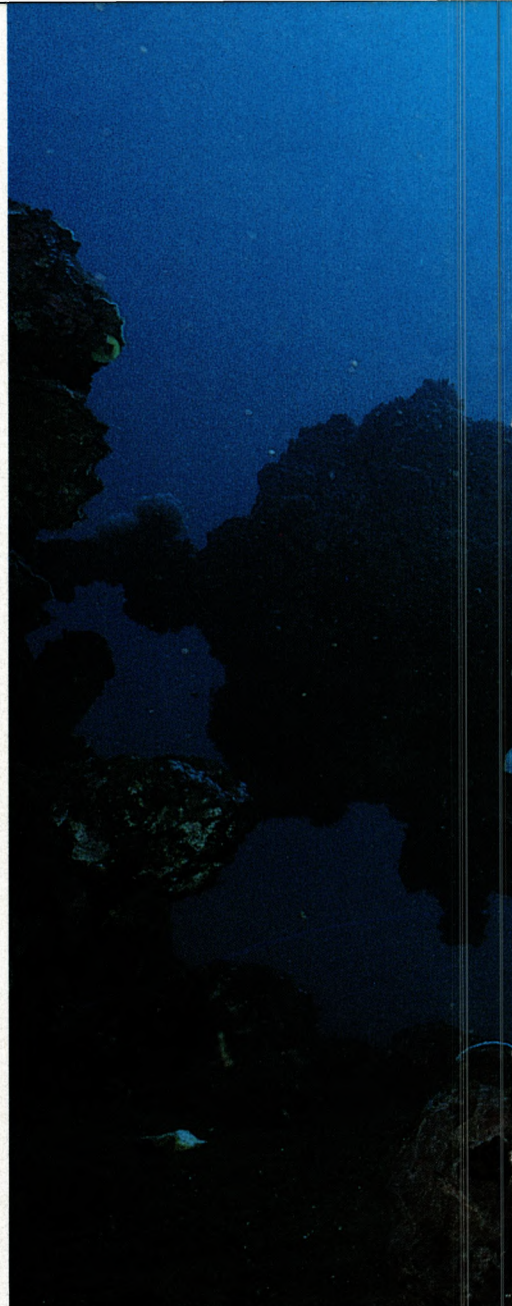
Steve's motto is "satisfaction guaranteed" whether in expertly guiding visiting divers through Rabaul's famous fleet of sunken Japanese vessels, posing for photographs beside wreck paraphernalia, touring divers around the local countryside in the Rabdive bus, or ragging the night away at the famous Rabaul Coffee Shop (feminists beware). If you are diving the

shipwrecks, you can really only do two decompression dives a day, so there's plenty of time to meet the locals.

Actually, the Coffee Shop deserves special mention. The proprietor, Tim, is the spitting image of John Cleese's Basil from *Fawlty Towers*. He manages to retain a bevy of beautiful smiling girls to run the place and even serve the odd cappuccino, South Pacific Lager or tequila. The decor has been specially designed to appeal to all tastes. The pictures are varied: there is an enormous, almost surreal mural of Rabaul Harbour, surrounded by active volcanoes; posters of a German shepherd and puppy, and even an illuminated scene from a Japanese water garden to take your mind off other things. Lighting intensity is well below candlelit, even in the middle of the day. Highly recommended for entertainment, refreshments and even food.

But, back to the diving. Rabaul is ideal for the hardened wreck fiend with 54 known Japanese war wrecks in the harbour, plus a few outside. Around 12 of these are divable on air, depending on your enthusiasm and experience. Myriads of colourful fish and kaleidoscopic colours it ain't; instead, try hulking great brutes of ships, the best at narcotic depths, featuring heaps of artefacts and rabbit warrens of decks to penetrate.

To take you on the better dives in the harbour, Steve or Frank will want to see your logbook showing plenty of hours and recent deep diving experience. This doesn't mean diving



A coral cod shares the remains of the bridge on the Georges wreck with dive instructor Steve Philp.



A round of ammunition lies near the bow of the Georges wreck, which is outside Rabaul Harbour.

Rabaul Dive Centre instructor, Steve Philp, models a Japanese WWII gas mask from the naval service vessel, *Hakkai Maru*.

novices can't enjoy the wrecks, merely that they will be limited to deck swims on some of the shallower vessels in the harbour, the biplane wreck (at 27 metres) or sections of *George's Wreck* outside.

Ah, the *George's*! This is the stuff of dreams, the sort of wreck even non-afficionados should visit to see what the attraction is. Definitely worth several dives.

The vessel remains unidentified. So-called because it was discovered by one "George", it lies comparatively intact on a coral reef only 30 metres off the jungle-clad shore and upright at about a 30 degree angle. It is 12 metres to the top of the bow, but some 57 metres to the bottom at the stern. Not only is the setting spectacular, but 30 metres plus visibility is normal, even on a dull day. From the top of the rear mast at 40 metres, we looked forward to see ►

RABID DIVING *continued*

the bow silhouetted against the surface and the dive boat overhead. A lone manta capped the scene, circling the mast. The *Georges* is a safe wreck because of the good visibility combined with easy penetrations at moderate depths (18 to 30 metres). At the same time, it is desperately tempting to swim down to the stern, clearly laid out 20 metres or so below the rear of the midships cabin.

Apart from being visually stunning, the wreck is nearly ideal photographically with lots of windows for framing shots, pink and white soft corals and plenty of bright surface or blue water for backgrounds.

We dived one other wreck in the clear water outside the harbour, a Mitsubishi "Pete" biplane, intact with prop, radio and machine guns. It is located just off a fringing reef, on sand, festooned with soft corals contrasting with the angular, man-made shapes of the wings and fuselage. On this dive, we had three mantas for company.



The Rabaul market is famous for the quality and quantity of produce sold there. Well worth a visit.



The authors and photographers, Gert de Couet (left) and Andrew Green (right). Photo by Marilyn Ball.

Back in the harbour, visibility is not normally as good, particularly on the shallower wrecks. Expect somewhere between 10 to 20 metres, although inside the wrecks it is very clear until the silt is stirred up. Our favourite wreck is the *Hakkai Maru* for all-round accessibility and interest. It is a naval engineering vessel, 127 metres long and 5114 tons, sitting upright and approximately level. Again, it is worth several dives if time permits, to separately explore bow and stern and for penetration.

The bow features anti-aircraft guns and a mine sweeping device. Masts and rigging make interesting silhouettes against the surface. Below decks at about 45 metres is a workshop, complete with lathes, drill presses and a band-saw. A stern swim can cover the bathrooms, more guns, a hold full of sake bottles, unexploded bombs, the engine room, or the area with the huge manually-operated steering gears.

A typical morning dive profile to a wreck like the *Hakkai* is 15 to 20 minutes bottom time, followed by a slow ascent (10 metres/minute) with stops of 1 minute at 18 metres, 2 at 11 metres, 5 minutes at 7 metres and 15 to 20 minutes at 4 metres. Penetrations on the *Hakkai* are fairly safe; there is some natural light in most below deck areas, although hanging electrical cables and some narrow hatch ways require care.

Afternoon dives are restricted to no more than 30 metres for 10 to 15 minutes, with equally long decompression times to provide a large safety margin. A Japanese Zero fits nicely in this category. Intact, it sits upright on sand at 30 metres, a short distance from a fringing reef, which at first sight appears quite barren. Closer inspection, however, reveals blue Linkia starfish with identically coloured com-

mensal shrimps; anemones and solitary corals containing other shrimps from the genus *Periclemenes* are patterned with bands of the same colour as their hosts and separated by areas that are so transparent as to defy visibility, even when you know you are looking at the "missing" parts of the animals. "Prong-pokers paradise" we called it, mindful of friends equipped with Nikonos macro gear who could be blissfully occupied here and oblivious of the fighter plane a few metres away.

The Dive Facilities

Rabaul Diving Centre is a PADI-affiliated full service centre (including hydros). All gear is available for hire or sale. A 30-foot diesel displacement boat is used for dives in the harbour. Dives outside are from the shore or Apollo inflatable. Much of the Rabaul diving is essentially off any dive tables currently recommended for recreational diving. You should be a certified advanced diver/deep diver and be able to prove experience in using repetitive dive tables and decompression dives to dive the deeper wrecks. Remember that the nearest decompression chamber is in Townsville, Australia and that it may take days to get there. Just in case, take out travel insurance that will cover the risk of scuba diving (read the small print), with adequate cover in the event of an accident.

Reef and wall diving is also available around Rabaul. However, to sample the best unspoiled areas, a combined Walindi/Rabaul package is recommended.

Sleeping and Eating

There is no dive resort or live-aboard as such at Rabaul. However, Kaivuna Resort Hotel is recommended for accommodation and best booked as part of a package, as room rates are otherwise very expensive. Rooms are airconditioned.

Each of the three hotels in Rabaul has a



restaurant attached. Average main course prices are about K6 to K10 (lunch) and K9 to K15 (dinner). If you need to economise, try making your own breakfast from supplies such as paw paws the size of basketballs, at 50 toea, or enormous avocados at 20 toea from the Rabaul markets (well worth an excursion in any case). The famous Rabaul Coffee Shop and several small takeaways are also good options.

Other Activities

The activities include watching sailors try to

chat up the girls at the Rabaul Coffee Shop; socialising at the Yacht Club; wandering around meeting the locals; exploring 300 kilometres of tunnels built by Indian slave labour under the Japanese occupation; or visits to wartime aircraft wrecks in the bush near the airport or the seismological station. You can also indulge helicopter flights (or walks, if you feel you must) to observe Matupit or Mother, two of the many volcanoes in the area. There is also a movie theatre and heaps of television channels available.



A Summary of the Divable Wrecks



HAKKAI MARU

Naval engineering vessel, 5114 tons; upright.
Sunk 17 January 1944.
Depths: bow 39 metres/stern 30 metres.



MANKO MARU

Refrigeration vessel, 1500 tons; upright.
Sunk 2 November 1943.
Depths: bow 24 metres/stern 24 metres.



ITALY MARU

Cargo transport, 5859 tons; on starboard side.
Sunk 27 December 1942.
Depths: bow 30 metres/stern 30 metres.



SUGAR CHARLIE/MITSU MARU

Transport vessel, 400 tons; upright.
Sunk 10 December 1943.
Depths: bow 12 metres/stern 12 metres.



IWATE MARU

Transport vessel, 2985 tons; on port side.
Sunk 17 February 1944.
Depths: bow 18 metres/stern 18 metres.



YAMAYURI MARU

Transport vessel, 5028 tons; upright.
Sunk 17 January 1944.
Depths: bow 42 metres/stern 39 metres.



NO. 2 YAMATO MARU

Transport vessel, 4369 tons; upright.
Sunk 18 April 1943.
Depth: 30 metres.



KANSHIN MARU

Transport vessel, 2000 tons; upright.
Sunk 17 January 1944.
Depths: bow 39 metres/stern 54 metres.



GEORGES WRECK

Unidentified transport vessel.
Reached by inflatable boat or shore dive; upright at 30 degrees on reef.
Depths: bow 12 metres/stern 57 metres.



BARGE POINT WRECK/TAKUBAR

Unidentified transport vessel.
Depth: 18 metres.



ZERO AIRCRAFT M16

Shore dive; upright on sand.
Depth: 30 metres.



MITSUBISHI "PETE" BIPLANE

Shore dive; upright on sand.
Depth: 27 metres.

RECREATIONAL HARD HAT DIVING

A scuba diver dons the lead boots and full hard hat dress to experience an older, traditional form of diving still in commercial use today.

Text by Jeff Maynard Photographs by Warren and Rebecca Maynard

My tenders lower the helmet over my head and twist to lock it in place. There's a bit of fumbling going on because it's the first time for them too. I'm struck by an eerie silence followed by the slow hissing of the air entering the hard hat. Then, I hear the voice coming from a speaker at my right ear. "Jeff, you control your air flow now. keep venting the suit and don't let the carbon dioxide build up."

I reach up and feel the brass valves, one each side of the helmet. To the left is the inlet valve, to the right the outlet. I turn the left side and make sure I'm getting enough air. The suit slowly begins to inflate. Then I open the outlet so that I don't blow up to become a huge balloon. I play with these valves for a few seconds until I think I have the flow just right and I take a look around.

At every point the helmet is closer to my face than I'd imagined. My face seems almost pressed against the porthole in front of me. I turn my head to see the portholes either side, then look up to see out of the one slightly above my forehead.

"Jeff, check your knock valve", the voice in my ear says. I push my chin against the emergency outlet valve in the helmet. Much like the dump valve on a BC, this valve is designed to stop you overinflating the suit and ascending too fast. With hard hat diving, the "full dress" becomes your buoyancy control. As I push the knock valve, I hear the rush of air out of the helmet and tell Mike Macfarlane, who's controlling the dive, that it's OK.

I hear two taps that echo through my ears and realise my tenders want me to stand up. I do this, and feel like Frankenstein's monster as I raise myself from the stool. A face appears in front of the porthole and gives me the OK signal. I signal OK back.

The voice in my ear speaks again, "Jeff, we're going to walk you over to the cage and lower you into the water."



Wearing the traditional red beanie and full hard hat dress, Jeff readies himself for a walk underwater at Portsea Pier.

A tender takes each arm and I start to walk as they guide me. Each step is an effort, weighed down by the nine kilo boots. With their guidance, I step into the steel cage. The cage lifts off the ground and is swung over the indoor training pool at Melbourne Diving Services. The pool is just two metres wide, but 10 metres deep.

"We're going to lower you into the water up to your neck."

I feel the cage descend and the water presses on the suit. As the folds of the bulky suit press against me, I recall someone saying how easy it is for the flesh of the legs and arms to be caught in the folds under pressure and that hard hat divers often found themselves covered with love bites after a dive.

The water is up to my neck and I feel the pressure all over me. I keep adjusting the inlet and outlet valves, occasionally hitting the knock valve with my chin to vent air from the suit.

"We're going to lower you under the water and check for leaks in the suit."

I see the water bubble up past my faceplate. As it covers the helmet the noise of the incoming air and my breathing is magnified. I'm underwater in a hard hat diving dress!

Still in the cage, I can start to experiment with my buoyancy. Closing the outlet valve and allowing the suit to inflate, I begin to rise like I'm riding inside a giant balloon. I push the knock valve and a few seconds later feel myself descend. With a few seconds of practice, I can get myself neutrally buoyant.

Time to leave the cage. I step out of it and grab the shot line that has been lowered to the bottom of the tank. Venting more air out of the suit, I start to descend, holding onto the



A diver in traditional hard hat dress is not a common sight under Victoria's most dive pier.

shot. Halfway down the tank are portholes and I stop to look out, and regain neutral buoyancy.

I continue on to the bottom, then spend the next half hour practising my buoyancy control, sending signals via the lifeline and raising objects using lift bags before reversing the process and being lifted out of the tank in the cage.

A week later, it's time to do it in open water. It's a sunny summer Saturday and we've set up the gear on the Portsea Pier. Portsea is south of Melbourne near the entrance to Port Phillip Bay, and the pier is used by more scuba divers and dive boats than any other in the state. Today we're drawing crowds as, one after another, the people doing the hard hat course climb into the suit and don the helmet.

When my turn comes, my tenders help me dress. I get the mandatory photos taken and the helmet is lowered over my head. There's no cage this time, and it's a matter of turning around and climbing down a ladder. Once in the water, I run through the same drills, controlling my buoyancy and checking for any leaks.

Satisfied, I descend to the bottom and turn to go for a walk beneath the pier. At this point, I learn something else about hard hat diving; it's bloody hard to walk. Well, not so much hard, as different. Some of the others in the group said they found it easier to walk backwards. I lean into the direction I'm attempting to go until my body is at an angle of about 45 degrees and plod forward with small steps.

In this manner I go for a "stroll" under Portsea Pier. Scuba divers buzz around me like flies, waving and staring at a sight rarely seen these days. I'm having a great time! I wave back at the divers and continually check my air flow. As I walk about the pylons of the "most dived pier in Victoria", I think of some of the stories I've heard about hard hat diving. One of them is "the squeeze".

Squeeze used to occur when a hard hat div-

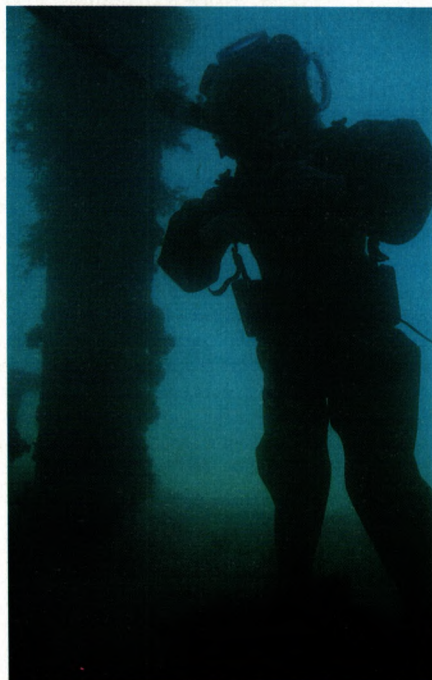
er's air supply was suddenly stopped, like when the air line was severed. The air pumped down from the surface equalises the pressure in the full dress hard hat diver's suit. If the pressure from above suddenly stops, the pressure of the water pushes all the air back up through the severed hose. Before one-way air valves were introduced (which stop air leaving the hat through the air hose), a cut in the hose at depth meant that the pressure of the water "squeezed" everything up into the helmet as it tried to escape to the surface via the air hose. Everything means everything, and the sad reality of a case of the squeeze meant the diver was literally squeezed into the helmet. The tenders would raise the helmet by means of the rope life-line and the helmet was buried in a grave.

But under Portsea Pier, squeeze can hardly be considered a threat. Plus the modern Japanese helmet we're using is fitted with a non-return valve.

I complete my "walk", and with a great deal of effort climb the steps and sit back on the stool. There's a hiss as my tenders lift the helmet off my head and I'm breathing surface air again. I'm elated at having got a sense of what hard hat diving is about.

Recreational hard hat diving is a course run by Melbourne Diving Services (MDS) of West Heidelberg to give certified scuba divers a chance to experience a part of diving history. It's run by Mike Macfarlane, who is both an expert scuba diver and a commercial diver with hard hat experience in Australia, Scotland and other parts of the world. The course consists of an evening of theory, a day spent working in the MDS tank, and a day at the Portsea Pier. If you're interested in diving heritage, I thoroughly recommend you give it a try.

A professional writer and Scuba Diver field editor, Jeff Maynard is known for going to quite some extremes to get a good story.



For his stroll about the pylons, Jeff leans until his body is at a 45-degree angle and plods forward with small, clumsy steps.

travel notes

Quicksilver Diving The Reef

Quicksilver Diving Services offers a variety of diving alternatives for divers travelling to North Queensland. From full-time courses and introductory diving to daily dive trips for certified divers, they claim to have the ultimate diving experience on the outer barrier reef.

A PADI Dive Centre, Quicksilver has a staff of 10 divemasters and instructors with a wide range of courses to the

For divers, the *MV Quicksilver* vessels run daily trips to Agincourt Reef, 39 nautical miles north of Port Douglas. At the reef base, certified divers then transfer to the custom-built dive tender for the first of two dives. Depending on weather and tides, there is a choice of five to 10 different sites with visibility regularly 30 metres or better. All standards of certified divers are catered for, with a fully qualified divemaster on-board for supervision.

Quicksilver emphasises that they dive the true outer barrier reef, not the middle or inner reef, but the most eastern edge of Agincourt Reef. Here divers can expect to see spectacular coral, a huge variety of marine life and fantastic reef bommies.

Full equipment is provided on dives or divers can bring their own. Quicksilver also has a full range of state-of-the-art diving equipment in their retail shop at the company's headquarters at Marina Mirage, Port Douglas.

For further information on bookings, contact your local travel agent or Quick-

silver direct. Quicksilver Diving Services, Shop Number 12, Marina Mirage, PO Box 228, Port Douglas QLD 4871. Telephone (070) 99 5050, fax (070) 99 5525.

New Guinea Excitement

Dugouts and dugongs, wrecks and whales, plunging coral dropoffs and spiralling volcanic mountains — that's a sample of what you can expect from Milne Bay Marine Charters. Divemaster Rob van der Loos has spent the last 12 years exploring the islands, cays, bommies and dropoffs of Milne Bay Province on the southern tip of Papua New Guinea.



On the purpose-built dive boat, *Tania*, you take in the best dive spots in the area, even virgin dive locations. Designed for six guests, the boat is small enough to reach the best reefs and visit native villages. The diving is unlimited and not for the uninitiated.

The Milne Bay Marine Charters package includes tanks, air, weights, accommodation, meals, soft beverages and transfers to and from the airport. Divers are encouraged to bring all other dive equipment.

For more information on the *Tania* and a colourful brochure, contact: Milne Bay Marine Charters, PO Box 176, Alotau, Milne Bay Province, Papua New Guinea. Telephone 61 1167, fax 61 1001, telex NE 61111.

Christmas Island Expeditions

A newly established company based on Christmas Island operates tours and expeditions on two of Australia's most

isolated and remote islands — Christmas Island and the Cocos (Keeling) Islands.

Tours and expeditions on the two islands in the Indian Ocean offer contrasting natural features. Among the most remote and isolated oceanic land-masses in the world, they are "living laboratories" for the biologists who study animals and plants in both pristine and highly altered terrestrial and marine habitats.

Christmas Island is the 360-metre high peak of a submarine volcano. Rocky, rugged and past sea levels, it has a terraced appearance. Most of the island is dense tropical jungle, home to some of the world's rarest seabirds and other spectacular wildlife and marine life. The annual red crab spawning migration is rated as one of the natural wonders of the animal world. Christmas Island is fringed along much of its coast by terraced coral reefs which, in some places, drop abruptly to oceanic depths. The rich diversity of fishes and corals complements the true clarity of the waters.

In contrast, the Cocos (Keeling) Islands also top submarine mounts, but are true coral atolls with a maximum elevation of only 12 metres above sea level. Charles Darwin visited these atolls in 1836 onboard the *Beagle*, and it was here that he was inspired to formulate his theory of atoll formation.

Cocos (Keeling) Islands have two major marine habitats: the oceanic reef platforms that drop off to the seafloor in a series of terraces and the sheltered lagoon of the main atoll. Again, as with Christmas Island, the water clarity here is superb and there are abundant and colourful species.

Christmas Island Expeditions has its own structured programme of land-based nature tours and can also design diving tours and expeditions for tour operators, universities, groups and individuals. The company is designing and organising a special dive expedition to be led by the Curator of Crustacea of the Western Australian Museum in September. This expedition will cost \$3290 and includes airfare ex Perth and inter-island, accommodation, meals and at least four dives with free tank hires and airfills.

For more information, contact: Christmas Island Expeditions, PO Box 298, Christmas Island, Indian Ocean 6798. Telephone 0011 672 4 8274, fax 0011 672 4 8275.



outer reef and Low Isles. They also offer introductory diving and SNUBA for anyone who has never scuba dived before.

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The Jewel Of Vanuatu

Located only a short ferry ride from Santo, this tiny island in Vanuatu is a diver's delight in a relaxed, tropical atmosphere.

Dive coral reefs, the *President Coolidge*, *USS Tucker*, Million Dollar Point and the resort's resident wreck, the *Henry Bonnard*. They are all accessible by a short speed boat ride, and night dives and sharks feeds can also be arranged. The waters are warm and crystal clear.

When you're not diving, you can fish, sail an outrigger, visit outlying islands, track walk through the jungle or just lie by the pool or beach.

Presently, there are 8 fares (bungalows) on the 170-acre island, with four more planned for later this year. Each one is spacious, with a double and single bed, ensuite bathroom and verandah overlooking the beach. At the resort restaurant and bar, sample fresh foods of the area—fishes, crayfish, coconut crabs, tropical fruits—and a selection of wines and other beverages.

For further information on prices and availability, contact: Allways Travel Service, 168 High Street, Ashburton VIC 3147. Telephone (03) 885 8863 or toll-free (008) 33 8239.

Bokissa Island Resort

The Jewel of Vanuatu



Lady Elliot Education Week

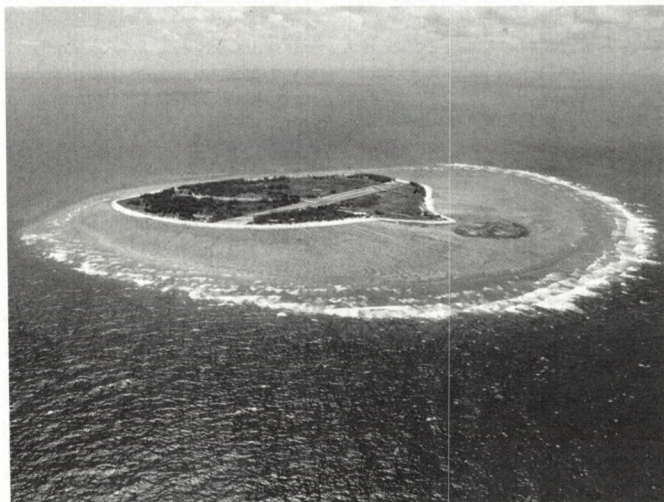
The theme is "education and enjoyment" for the first Lady Elliot Education Week, to be held November 3-10. The festivities will take place on both Lady Elliot Island and the Capricorn Bunker Group of islands aboard the *Undersea Explorer*.

There will be marine biology classes, specialty courses, underwater photography and, of course, plenty of diving. The itinerary includes three dives per day — shore and boat — plus night diving. And, for non-divers or surface

interval times, there will be reef walks, nature hikes and turtle and bird watching.

A special event of the week will be the contests with prizes for treasure hunts, photography, marine biology and other land and underwater activities. Prizes will include everything from diving equipment to holidays.

Bookings are very limited, so call early to reserve a space. For more information on the Lady Elliot Education Week, contact: Dive Travel Australia, 1st Floor, 33 Alexandra Street, Hunters Hill, NSW 2110. Telephone (02) 879 7160, fax (02) 879 7161.



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sea science

by H. Gert de Couet

A Living Fossil

Some 100 or 200 million years ago, it probably wouldn't have been safe to go to the beach. Long before the appearance of modern boney fishes, the oceans of the Mesozoic period were dominated by numbers of large predatory and scavenging invertebrates such as ammonoids and nautiloids with a chambered, external shell. They are the ancestors of the "modern" cephalopods, such as the octopus, squid and cuttlefish.

Some of these chambered molluscs were several feet long and caught their food by pouncing on unsuspecting worms, trilobites, fishes and smaller molluscs, the shells of which they crushed with ease using their beak-like jaws. The largest fossil cephalopod measured 5 metres in length.

It can only be speculated that the large-scale radiation and the evolutionary success of this group of animals was

based on the fact that, unlike all other invertebrates prior to this period, they had the capacity to swim freely thanks to the gas-filled chambers of their shell. All other animals sharing their habitat were confined to a crawling lifestyle and their world was essentially two-dimensional. Mobility gave the chambered molluscs the extra edge when chasing their prey and perhaps escaping their natural enemies, of which there would have been few, if any.

After an uncontested reign of more than 150 million years, the chambered cephalopods finally lost their kingdom to the predators of the modern seas, the much faster swimming sharks and boney fishes, which efficiently competed with them for food and habitat. For reasons not entirely clear, the once prolific group of ammonites disappeared completely along with the dinosaurs within a relatively short period of time.



Above & left: On a recent trip to Milne Bay, PNG on the *Telita*, we dropped baited fish traps down some 1200 feet to catch *Nautilus*. Eighteen hours later, we brought up 13 live animals that were immediately put back in the water for a brief, but exciting photography session before they dropped back down to depths greater than we could dive.

A few members of the ancient family of nautiloids, however, survived the competition with the modern life forms hidden in the deep waters of some tropical oceans. Six members of the genus *Nautilus* are the only extant species. Because they exhibit all the simple, external features shown by the extinct members of the family, they have been termed with the primitive survivors of a few other animal groups as "living fossils".

Strictly speaking, this is not true, since the speed of evolution is the same for all organisms. However, *Nautilus* has mysteriously escaped the dramatic rearrangement of body plan displayed by its modern relatives and shows all the features of a "primitive" cephalopod. It has a chambered, external shell, which in the "modern" cephalopods is either reduced to a cuttlebone or even completely absent, as in the octopus. *Nautilus* has almost 100 tent-

acles, as opposed to eight or ten in the modern cephalopods. These tentacles also lack the suckers typical of the modern successors of the chambered cephalopods, the octopus, cuttlefish and squid. Instead, they are individually lodged in sheaths and secrete a sticky substance that is used to catch prey.

Like other cephalopods, *Nautilus* has a strong jaw not unlike a parrot's beak, which is used to break the carapace of crustaceans or to kill fishes. The most primitive feature about *Nautilus*, however, is a pair of eyes that lack a lens entirely and work like a pinhole camera. These eyes produce a rather sharp, but not very bright image. It was suggested that the animals possess a rather acute sense of smell for orientation rather than using their visual sense at the depths that they inhabit. Two tentacles flanking the eyes presumably serve this purpose.

The ability to freely move about in space obviously poses a special challenge to the behaviour and to a nervous system that has to cope with having to judge distances in three dimensions. Perhaps this was the reason for the evolution of highly developed sense organs and a complex nervous system in the modern cephalopods. The amazing "manual" talents and intelligence of *Octopus* are well documented.

Locomotion is achieved by a funnel-shaped organ termed the hyponome, which has an analogous purpose in cuttlefishes and octopus. It produces propulsion by forcing a jet of water through its narrow aperture. *Nautilus* is fairly agile, but does not achieve the speed and mobility of a fish.

All known species of *Nautilus* inhabit the deep slopes of tropical coral reefs and very rarely are encountered in depths of less than 100 metres. Until recently, documentation of the animals in their habitat was limited to exceptional circumstances and chance opportunities. For example, specimens were encountered in the waters of New Caledonia on several occasions in rather shallow water by divers. On the other hand, they have been kept in captivity for many years and are now successfully bred in the Waikiki Aquarium in Hawaii. The limits of their vertical distribution seem to be determined by water temperature, rather than pressure. Their natural occurrence in shallow water therefore seems to be related to an abnormal water temperature distribution or freak upwelling currents.

A most striking behavioural pattern is the extensive vertical migration during dusk and dawn. Experiments carried out in Palau using animals tagged with tiny radiotransmitters and depth gauges showed that *Nautilus* ascends to shallower water at night, between 100 and 200 metres, and retreats to a maximum depth of 500 metres during the day. Many marine animals perform similar diurnal vertical migrations either to evade their potential predators or to follow the migration of their prey. Similar to other aspects of their natural history, the reasons for migrations of



***Nautilus* is one of a small group of animals termed living fossils because they escaped an evolutionary change in body and still retain the simple, external features of extinct members of the family.**

Nautilus remain mysterious and speculative.

The anatomical basis of these vertical movements is the chambered shell of the *Nautilus*, which has as many as 30 gas-filled compartments, the last one of which is actually occupied by the animal. At first, scientists expected the shell to explode upon bringing it to the surface since the pressure inside the gas-filled chambers would build up during the haul to the surface, provided gas is contained in these chambers at ambient pressures. But, this is not the case. In fact, the absolute pressure inside the *Nautilus* shell is less than one atmosphere.

Because of this, the animals have no problems with decompression. Exper-

imentally, the *Nautilus* shell implodes at a pressure of greater than 60 atmospheres, which corresponds to the maximum depth that *Nautilus* is found at, some 600 metres. Moreover, the animal is perfectly capable of controlling the level of liquid in the second to the last chamber, which it uses to finely tune its buoyancy.

The largest species, *Nautilus macromphalus*, grows to about one foot in diameter, weighing well over one kilogram. Incidentally, the largest specimens have been caught off the Great Barrier Reef. The Fiji islands are the home of a "dwarf" race of the species, which grows to only half that size.

Female *Nautilus* lay up to 10 cocoon-shaped eggs per year, which take almost two years to develop at 18 degrees Celsius before a completely formed miniature *Nautilus* hatches.

My first encounter with these strange animals was during a cruise aboard *M.V. Telita* somewhere in the eastern Milne Bay Province of Papua New Guinea where countless uncharted coral pinacles come close to the surface from great depths. We set an ordinary baited fish trap some 1200 feet deep. Eighteen hours later after recovering well over half a mile of nylon rope, 13 live *Nautilus*, countless deep-sea prawns, isopods, and a dead swell shark in the trap broke the surface. We immediately took the *Nautilus* back into the water.

After a few moments, the animals became active, lifting their protective hood to expose the eyes and tentacles. It was

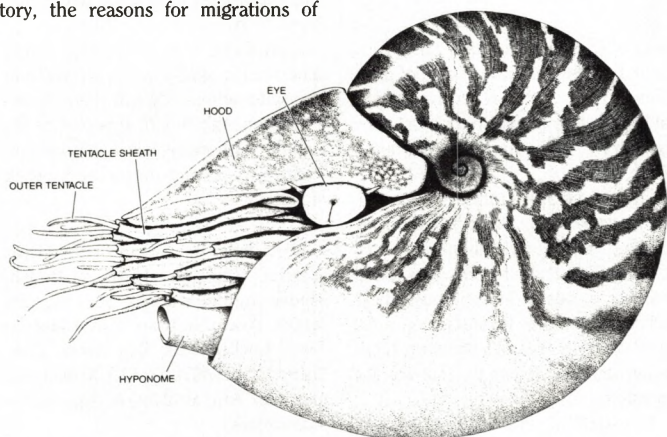
obvious that the animals were stressed because of the frequency of water pumping through the hyponome. It was also obvious that the animals were perfectly able to recognise the reef topology since they single-mindedly turned away from the light of my flash and headed towards the deep once they decided where the drop-off was.

Equally single-minded about finishing a roll of film on these creatures, I bounced twice to considerable depth before I let them go their way. It was amazing to see that the animals were perfectly buoyant at the depths we chose to take them, slightly rocking around the center of gravity of their horizontal axis. Some reef sharks took a keen interest in our activities, but probably decided that shelled cephalopods would give them indigestion. More likely, they had never seen these strange animals before either.

Nautilus trapping is part of the regular programme offered during *Telita* cruises of New Ireland or Milne Bay Province. There is no evidence to suggest that this procedure harms the animals in any way.

Recommended reading: *In Search of Nautilus*, P.D. Ward (1988). Simon & Schuster. ISBN 0-671-61951-9.

A lecturer in genetics at the University of New South Wales, Gert de Couet's underwater interests include photography and marine biology.

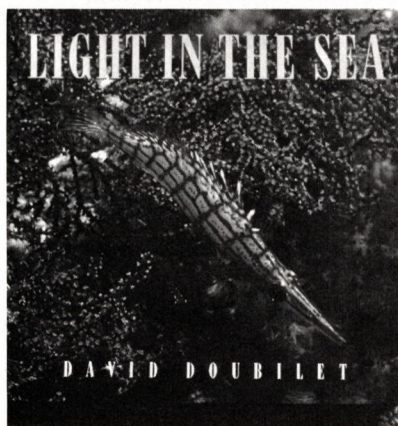


Gross anatomy of a *Nautilus macromphalus*.

books 'n video

The *National Geographic* magazine is respected worldwide for superb quality in photojournalism. As underwater photographers, we look to the magazine as a standard of excellence and inspiration for our own photographic pursuits. Eight times out of 10, the underwater photographer is David Doubilet, undoubtedly one of the world's most accomplished underwater photographers.

A long-awaited compilation of Doubilet's finest photographs has now been released in his first book, *Light in the Sea*. Photographs have been chosen not only for their intrinsic qualities, but also to illustrate some of the most unusual or unique underwater locations in the world.



One photograph in a 1984 issue of *National Geographic* has remained permanently implanted in my memory. With amazement, I could again enjoy the scene of a few lonely mullet swimming among the submerged rocks of Japan's Izu Oceanic Park under a foamy cloud of washing waves. Who could forget his beautiful photographic treatment of lionfish in another issue?

Australians should identify with the book because our part of the world has certainly not been forgotten. Jervis Bay and South Australia feature strongly. In addition, many local prominent diving personalities that most of us know are acknowledged in the book.

As a writer, Doubilet also manages to convey a sense of humour in many parts: "It was like some classic African safari. Bwana with camera bearers. I was Bwana." He also conveys emotion in other areas: "We had gone through a looking glass to a secret place in the sun . . . a dreamscape."

At the end of the book is a page I bet all underwater photographers will zoom into — the page devoted to a description of the photographic equipment that Doubilet uses. But note the last line: "The entire crew of the *National Geographic* photo equipment shop has supported me and helped to make these photographs. In a sense, they are with me on every dive."

All in all, the book is a great reminder that there are few stronger and more mysterious places on our planet Earth than that world beneath the sea.

Light in the Sea by David Doubilet. Thomasson-Grant. Hardback, 168 pages. RRP \$75.00. Available in major bookstores and book sections of department stores.

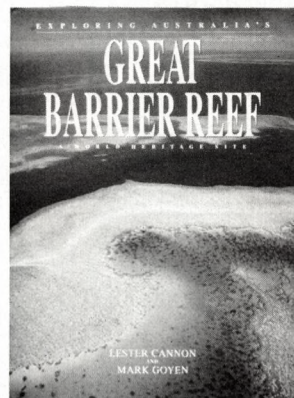
— Mark Spencer

The value of a good reference book was driven home just recently as I was planning a dive trip to the northern Great Barrier Reef. Having never been to this particular area before, I required a book that provided a broad base of background information. While many fine publications have been produced on the Barrier Reef, few cover all the aspects a diver needs when planning a vacation.

Coincidentally, *Exploring Australia's Great Barrier Reef* had just been published. In it, Lester Cannon and Mark Goyen have compiled a text and photographs that provide true insight into the many aspects of the life, history and recreational possibilities of the Barrier Reef. It was just what I needed.

A colourful history dating back before Captain Cook provides an understanding of the role the Barrier Reef has played in our country's past. Many of its islands and cays were once used as a refuge for shipwreck victims or for commercial ventures, often resulting in the name these land formations still bear today.

From a scientific perspective, the book provides a fascinating look at the coral reef itself — how the reef forms and the myriad species that live in harmony to make up what is truly one of the eight wonders of the world. Life above the waterline is also covered. The various islands and their flora and fau-



na are examined, as are the facilities available on each island.

Of particular interest is the chapter that deals specifically with diving. A breakdown of the various sections of the reef is provided with a list of good dive sites, climatic conditions and best times to visit.

A massive amount of detail is covered in a straightforward, authoritative manner and supported by many beautiful colour plates. If you want to read up on a potential dive site or simply enjoy looking at striking underwater photographs, this book is an excellent reference and suitable for the coffee table.

Exploring Australia's Great Barrier Reef by Lester Cannon and Mark Goyen. Angus and Robertson. Hardback, 240 pages. RRP \$39.95. Available in major bookstores and book sections of department stores.

— Mark Welsh

In just 93 pages, *Lady Elliot First Island of the Great Barrier Reef* provides you with a comprehensive portrait of Lady Elliot, the southern-most coral cay on the Great Barrier Reef Marine Park.

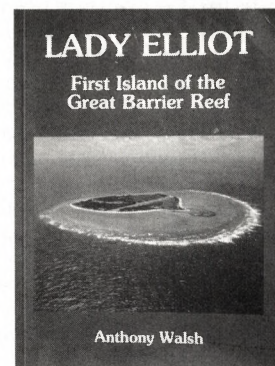
Anthony Walsh's interest in and enthusiasm for Lady Elliot began during his first visit in 1979 when he noticed a number of leather items with island scenery for sale at the lighthouse; there seemed to be some inconsistency in the spelling of the island's name on these souvenirs. One or two t's, that was the question.

Research into the spelling controversy uncovered a little treasure-trove of information about the island's at times

sad history. Today, visitors enjoying the lush flora and fauna (not to mention the sparkling waters and beautiful coral) would be unaware that the island was a wasteland less than 20 years ago, rendered barren by two decades of ruthless mining for guano and by the voracious appetites of feral goats.

The author not only describes the delights awaiting visitors now, but gives a detailed look at the history of Lady Elliot from its discovery by white explorers in 1816 through its near destruction by mining companies to the slow restoration and eventual limited access for the public. Along the way, the reader is treated to snippets of information about earlier inhabitants — lighthouse keepers and their families.

Many divers already enjoy the wonders of the Great Barrier Reef, but Walsh's description of turtles, corals, fish and the numerous enticing wrecks that have come to rest near the island's



shores will no doubt spur on many diving enthusiasts to enquire about holidays to secluded Lady Elliot.

Lady Elliot is an informative book; a non-taxing read, ideal for slipping into the suitcase or backpack if one is fortunate enough to visit this part of the country. Otherwise, use it as a good incentive for saving up for next year's holiday.

Lady Elliot First Island of the Great Barrier Reef by Anthony Walsh. Boolarong Publications. Softcover, 96 pages. Available from Lady Elliot Island, Locked Mail Bag No 6, Bundaberg, QLD 4670 for \$12.00 (includes postage). Also available in some major bookstores.

— Jette Bollerup

TEST REPORT

HYDRO-PROBE

In response to demand, a new style of underwater metal detector has been designed for commercial and sportdiving use. We test in on a Sydney wreck.

Text and photograph by Michael Cufer

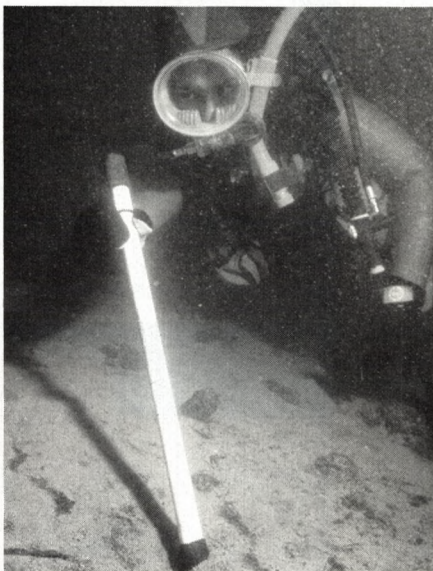
A retired Sydney University electronics engineer, Cecil Davis, realised that there is a demand for a more practical metal detector, one that can be used underwater for commercial diving and sportdiving applications. What he developed is unlike the basic large dish metal detector. The Hydro-Probe is a single rod configuration weighing around 300g and measuring 480mm in length.

According to Davis, the principle behind the workings of the probe is simple. A sensitivity control knob alters the differential adjustment, which sets a reference from which the probe detects the desired metal. The probe measures density and it's possible to set reference to anything above or below water. Differences in density between metals can be detected as well as changes from fresh to salt water.

The test model was used on a wreck in Sydney at a depth of 30 metres. Parts of the wreck have been buried in sand and the test was to find fragments that have been separated from it. Once at the bottom, the sensitivity control was set by pointing the tip downwards and turning the knob clockwise until the red LED light started to flash. It was then set to a reference and anything denser than the surrounding water will set the LED flashing faster and brighter.

Metalliferous objects under the sand were easily detected and, by adjusting the sensitivity control, objects over 300mm below were detected. The normal dish-type metal detectors can only penetrate to a distance equal that of the diameter of the dish; unlike the Hydro-Probe which, according to the manufacturer, can detect a few feet below the sensor even though the face diameter is only 30mm.

Prodding through the wreck, it was possible to determine what was timber, steel, glass or brass as long as the unit is set to a reference. The only shortfall of the unit is the need to reset it at a different depth when the sensitivity



changes, but this was not a major problem.

The Hydro-Probe housing is constructed of PVC tubing filled with epoxy resin that gives a good negative buoyancy feel. The unit contains a mercury tilt switch that is activated when held in the "sensor down" position. A 3.6 volt lithium battery runs the electronics and is

replaceable by returning it to the manufacturer. Battery life for normal use is two years but, according to the manufacturer, the lithium battery has a shelf life of 10 years.

When stored with the sensor up and the sensitivity control turned down, the probe will have an extended service life. At rest, the draw on the battery is only 60 microamps; in full use, it is still small at 3.5 milliamps. It is recommended that the travel position be the same as for storage, and since the unit contains electronics, it needs to be treated with care.

The Hydro-Probe marine metal detector can be used in locating pipelines, cables, wreck artefacts and lost metal objects. Other uses include setting a reference to indicate changes in salinity, detect pollutants and to distinguish steel from timber during historic wreck surveys.

The Hydro-Probe is small, but effective. It sells for \$150, which includes postage and handling in Australia. Enquiries can be directed to Probe Electronic Products, PO Box 149, Berowra Heights NSW 2082. Telephone (02) 456 1404.



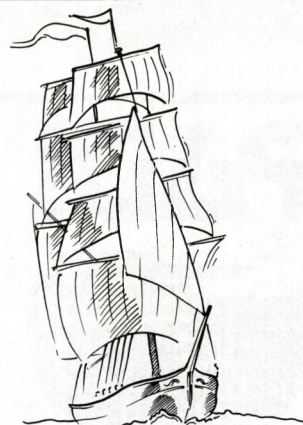
How's this for a dive boat?

The tall ship, Eye of the Wind, won't only take you through some of the best diving in the Pacific; she'll make life aboard an adventure.

The dives of a lifetime, the camaraderie of shipmates, all the romance and adventure of the past, with every modern comfort.

Jacques never had it so good.

For more information contact: Adventure Under Sail,
PO Box 79, Annandale, NSW 2039 Tel: (02) 560 4035



products 'n news

Graphic Lite Underwater System

After four years of research, Ocean Graphics has released a lighting system that gives divers wide-angle illumination without loss of brightness.

The hand-sized Graphic Lite head has multi-faceted reflectors with high-powered, 50-watt quartz halogen bulbs that produce a wide-angle beam equivalent in output to many other 100-watt units.

Ocean Graphics' emphasis on reliability means that every unit is hydrostatically tested to 100 metres and the halogen bulbs have 2000 hours design life, minimising the need for spare parts.

The straight cable reduces entanglement problems and makes the illumination unit suitable for wreck and cave diving. By using the Lite Packs, the Graphic Lite can be attached to scuba cylinders of all sizes. It also fits most buoyancy pockets — should you let go of it, it will not float away from you.

The sealed batteries provide 200 cycles between changes, and the unit can be recharged without disassembly by using the head switch. Running time for model M50 is 50-70 minutes and 90-120 minutes for the M50L.

The multi-faceted glass reflector provides even illumination with no hot spots — ideal for video lights. For more information, contact Ocean Graphics Pty. Ltd., 12 Hoffman Street, Cheltenham VIC 3192. Telephone (03) 583 8159.



PADI®



PADI Joins Jervis Bay Battle

PADI's Director of Australian Operations, Terry Cummins, announced recently that the organisation would throw the full resources of the newly developed Project AWARE (Aquatic World Awareness Responsibility and Education) behind the fight to save Jervis Bay.

All PADI Australia staff and their

families spent a weekend in Jervis Bay earlier this year to assess the situation. PADI Dive Centres in the Jervis Bay area are spearheading the campaign to petition the Prime Minister and the NSW Premier to establish a Jervis Bay Marine Park and are keeping divers posted on any developments via newsletters.

The area was recently visited by the Federal Environment Minister, Senator Graham Richardson and famous ocean explorer, Jacques Cousteau. Senator

Richardson reportedly said that he had "no objection to declaring the Federal Government's 20 percent of the Bay a natural park" and urged the NSW Government to nominate the other 80 percent.

Cummins, a trained geographer, made the observation that the Bay just could not stand the constant onslaught by man and cited overfishing, illegal scallop dredging, naval bombardments, and the removal of seagrasses as major concerns. He reported that the giant

blue groper are almost entirely gone and grey nurse sharks are only infrequently sighted. With the loss of significant seagrass beds, the bottom of the Bay has become somewhat unstable, leading to a general reduction in visibility for divers.

PADI intends to continue lobbying relevant government departments for the creation of a marine park in the Jervis Bay area. For more information, contact David Ogilvie, PADI Australia, Unit 1, 1-7 Lyon Park Road, North Ryde NSW 2113. Telephone (02) 888 5899, fax (02) 805 0870.

Correction On DDL 2000

The suggested retail price of the Digital Dive Log 2000 watch was incorrectly listed in the June/July issue as approximately \$100. The correct prices are \$350 for the black model and \$550 for the gold. For further information, contact Tabata Australia, 86 Falconer Street, West Ryde NSW 2114. Telephone (02) 807 4177, fax (02) 808 1638.

New SSI Open Water Training

Scuba Schools International has recently released an integrated video-based system for open diver training to provide dealers and students with a more versatile system.

SSI's new programme allows instructors and students flexibility in deciding style and format of the course. The course can be structured along a tradi-

tional method of class instruction with full instructor support or students have the option of completing all academic training through home study, with instructor support during pool sessions. A third possibility is to complete part of the academic training through home study and supported by the instructor as needed. The system only allows that the academic instruction be completed at home, never water training.

For today's dive consumers who are often busy professionals, SSI's new



Chameleon BC

Dacor's Color Match System allows for easy change of colour coordination by replacing the removable shoulder panels and gusseted pockets.

The Chameleon is a low-profile, single bag (bladderless) construction, which means more comfort with less bulk and drag. According to the manufacturer, the soft "alpine" type contoured backpack gives good lumbar support and positive positioning without movement even during very active dives. The pockets have additional Velcro-secured second stage and gauge holders premounted.

The Chameleon BC is available with interchangeable soft and standard hard packs to allow for easy conversion. A deluxe colour completion kit includes reflective epaulettes, expandable right pocket "goodie bag", and gusseted left pocket with zipper closure. Both standard and deluxe kits are available in sizes XS, S, M, L and XL.

Choose from a wide range of vibrant colours to coordinate your BC with your other diving equipment. More information from Moray (Aust.) Pty Ltd, PO Box 529, Sutherland, NSW 2232. Telephone (02) 521 8922, fax (02) 521 6926.

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For further information see your nearest dive store or contact:

Terra Maris Pty Ltd
(02) 451 4534 Fax: (02) 975 2600
5 Robyn Ave, Frenchs Forest 2086
Recommended Retail Price: \$99.50.



training system can reduce the duration of classes by allowing student's to complete part of the studies at home at their own pace. The full-motion videos reiterate the material learned from the manual and the material is further reinforced as students answer questions in the workbook and attend lectures and pool sessions.

The SSI Open Water Diver Training System includes a set of three videos featuring six titles, a manual, workbook with answer sheets, exam, log book, dive tables and a newly designed patch, diploma, kit case and folder. The system is available from SSI dealers. For more information, contact: SSI Australia, 989 Victoria Road, West Ryde NSW 2114. Telephone (02) 808 3821, fax (02) 808 3141.

Book On The Blue Revolution

For fans of the *The Blue Revolution*, a book is in production and scheduled for release before Christmas.

The Blue Revolution, which aired in Australia and throughout the world earlier this year, is an excellent documentary centred on man's relationship with the sea in the past, present and future. The eight programmes were "In the Blood of Man", "The Last Hunters", "The Struggle for the Seas", "Return of the Child", "The Blue Highways", "The Treasures of Neptune", "The Healing Sea" and "The Ocean Planet".

The driving force behind *The Blue Revolution* is Luc Cuyvers, author of

four books on ocean issues and numerous academic reports and articles that have been published in European and American publications. Cuyvers, who also holds a doctorate in Ocean Management from the University of Delaware, began work on the documentary in 1985, conducting the initial research and soliciting funding for the project.

Producers of the series spanned the globe and included ABC-TV, Australia; Asahi Broadcasting Corporation, Japan; KRO, Holland; HTV Bristol, UK; The Discovery Channel, USA; UNESCO;

The Intergovernmental Oceanographic Commission and The Mare Nostrum Foundation. ABC-TV produced four of the eight films, and all eight of the series were narrated by Australian actor Keith Michell.

"The Australians were the best people we had to work with," said John Vermilye, Vice President of The Mare Nostrum Foundation, "because they really put their heart and soul in it. I think there is a real commitment with the ABC to do quality TV."

Copies of *The Blue Revolution* will be available in ABC bookstores and major book departments.

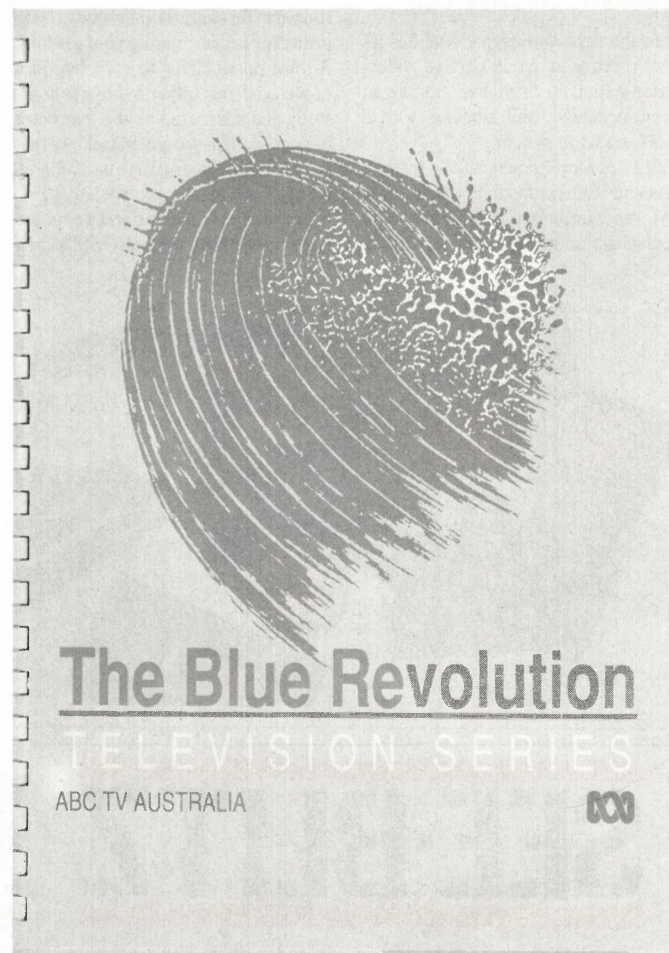
Rugged BC With Features

Apollo has developed the A.B.J.R. Buoyancy Control Jacket to cope with harsh treatment and a rugged environment. They use 840 Denier Polyester outer and inner, as well as coating the inside with U/V stabilized PVC. The BC is subjected to a range of tests, including 100,000 inflations and deflations, in Apollo's Environmental Testing Unit where all outdoor conditions can be simulated.

Chest squeeze is minimised by the use of a hinged baffle design that inflates outwards and wraps the body like

a comfortable kidney belt. Other features include an adjustable cummerbund that fits all sizes, two removable clip-on pockets, whistle, quick-dump valve, inflator hose pull dump valve and adjustable cam-lock tank strap.

The Apollo A.B.J.R. is available in small, medium, large and extra large, in blue with aqua trim. More information from: Apollo Australia Pty. Ltd. Unit 13, 17-21 Bowden Street, Alexandria, NSW 2034. Telephone (02) 699 6866, fax (02) 690 1060.



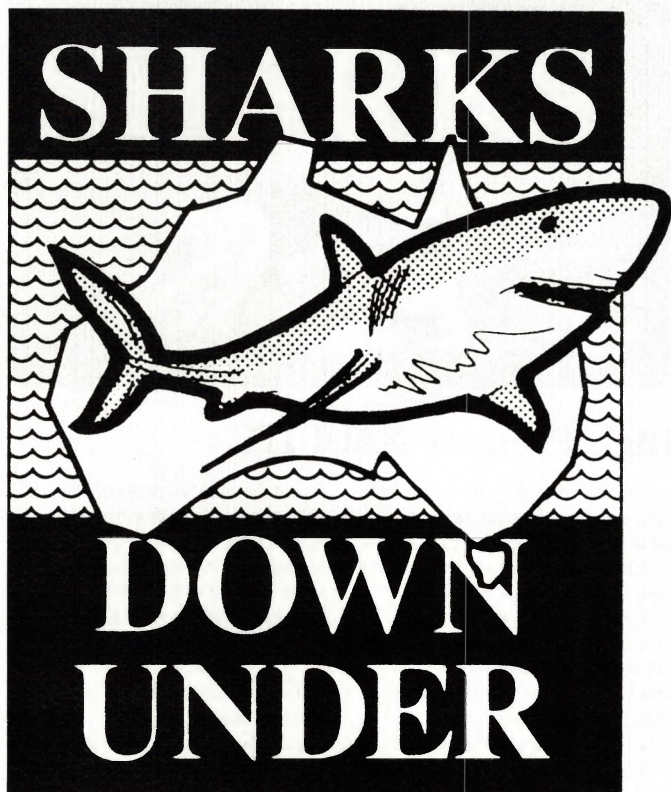
Sharks Down Under Conference

Dates have been set for the 1991 Sharks Down Under Conference in Sydney — 25th February to 1st March.

An international conference, Sharks Down Under will provide an opportunity for the dissemination of information by shark and ray researchers, captive managers, marine biologists, naturalists and conservationists from Australia and

overseas. There will be two components to the conference — scientific and public — which will include presentations and lectures by Australian and overseas shark experts. There will also be a number of social events and a conference dinner.

Guest speakers include Ron and Valerie Taylor, underwater filmmakers and naturalists; Dr John Stevens, Senior Biologist, CSIRO, Tasmania; Dr Eugenie Clark, Professor of Biological



Sciences, Maryland University; Dr Jack Randall, Senior Ichthyologist, Bishop Museum, Hawaii; Dr Sonny Grubber, Biology and Living Resources, Miami University; Dr Greg Cailliet, Professor, Moss Landing Marine Laboratory, California; Frank Murru, General Curator and Vice-President, Sea World of Florida; Dr Jack Casey, Chief, Apex

Predators Investigation, National Marine Fisheries Service, USA; Dr John McCosker, Director of Steinhart Aquarium, San Francisco, California.

For more information on Sharks Down Under, contact: John West, Shark Conference Organiser, Taronga Zoo Aquarium, PO Box 20, Mosman NSW 2088. Fax (02) 969 7515.

Dynamax Fins

Maximum propelling power with the least labour is what everyone looks for when choosing fins. The elastic properties of urethane, the polymer used in the manufacture of Apollo's Dynamax Fin, make the fin blades springy enough to improve the drive power of the fins.

The surface strength of the material

provides resistance to tearing and scratching and prevents delamination from the foot pocket.

Adjustment is easy with buckles that have adjusters to control the length of the strap. By simply pulling both or either ends of the straps, you can adjust the fin underwater. To remove the fin, push back the strap with the heel

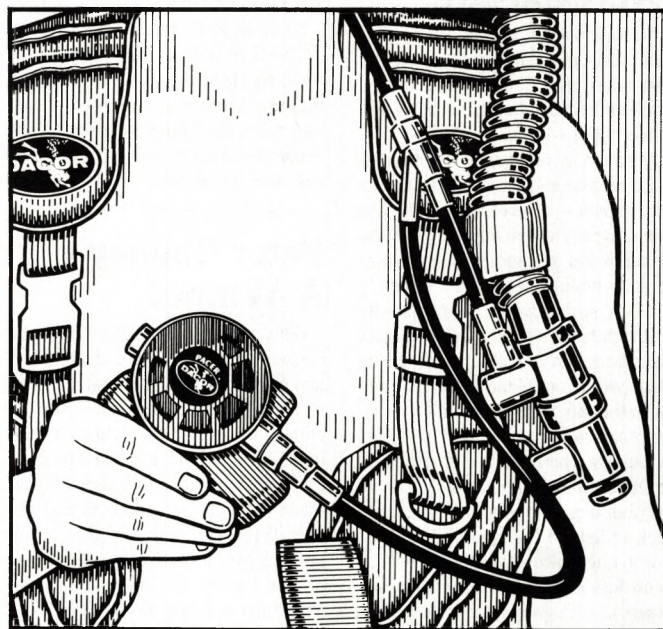
New Alternate Air System

Dacor's Gemini Air System integrates two important functions into a one-hose assembly for one-hand operation. Divers can share their main air supply with a diver-in-need while retaining full control of the buoyancy control device.

It serves as a low-pressure air delivery system to Dacor's BC power inflator assembly for diver manual buoyancy control adjustment. The unit also provides the diver with a built-in alternative air source for use in emergencies or training situations. A normal ascent is pos-

sible while the diver-in-need breathes from the Gemini's auxiliary second stage. The primary second stage is retained by the donor and the design allows constant eye contact between donor and diver-in-need during the ascent.

The Gemini Air System is available as a left or right hand breathing source. For further information, contact: Moray (Aust.) Pty Ltd, PO Box 529, Sutherland, NSW 2232. Telephone (02) 521 8922, fax (02) 521 6926.



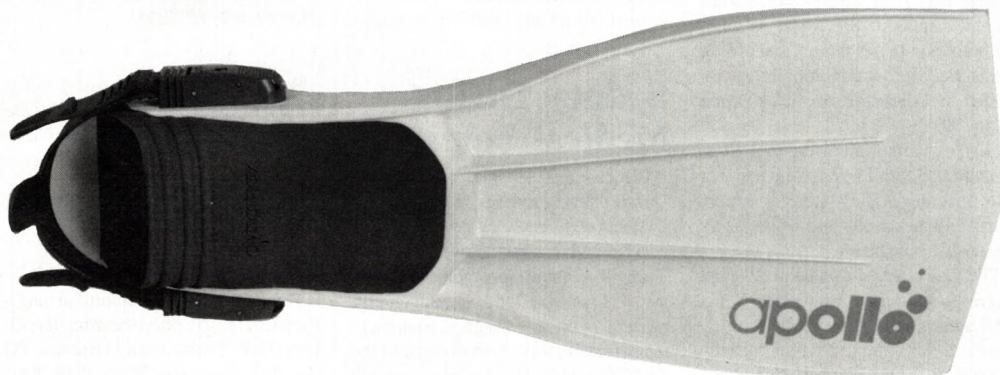
PADI Medic First Aid

Do you know how to administer first aid? Are you confident that you would actually put your skills to the test should an emergency arise?

An American survey shows that many graduates of conventional CPR and first aid courses hesitate to use their skills when faced with a real medical emergency. This is of great concern because a prompt response by a trained person can be the deciding factor in a medical emergency.

The PADI Medic First Aid course was developed to ensure that graduates of the course will be both willing and able to give assistance. Unlike some conventional CPR and first aid courses, Medic First Aid teaches CPR and first aid together, establishing the same priorities as used by emergency medical personnel but designed with lay persons in mind.

The course aims to build the graduates' confidence, and research shows ▶



that of 4401 graduates who had witnessed a medical emergency after completion of the course, 98.66 per cent provided or offered assistance.

Medic First Aid is available exclusively through PADI Dive Centres and PADI Instructors. For more information, contact PADI, Unit 1, 1-7 Lyon Park Road, North Ryde NSW 2113. Telephone (02) 88 5899, fax (02) 805 0870.

Solozone Against Overexposure

An estimated 125,000 Australians have skin cancer but don't realise it. Last year over 1,000 people died as a result of the most dangerous of all skin cancer types — melanoma.

Australia is renowned for its long coastlines, deep blue water, clear skies and hot sun — an environment ideally suited to people with aquatic interests. Scuba diving and snorkelling are particularly popular with water lovers.

When scuba diving, there may be little exposure to the sun, but extra care must be taken before or after diving when you are out of the water and basking in the sun. Snorkelling on the other hand can cause problems. Time drifts by quickly when you are floating and observing the sea floor and fish — all the while exposing your back, neck and back of legs to the sun.

Don't be fooled: an overcast cool day is no less dangerous in terms of exposure to ultra violet rays. Whatever the

conditions, take some sensible precautions. Cover up as much as possible, limit the time spent in the sun, avoid it altogether between 11 am and 3 pm and choose a waterproof sunscreen that offers protection from all harmful rays.

Solozone is a new generation sunscreen from ICI that gives maximum protection (15+) using a lower level of chemical ultra violet absorbers. It can be used on young children and anyone who has highly sun-sensitive skin and sunspots or has a history of skin cancer. Solozone remains effective after two hours in the water and is PABA-free and non-staining.

So, to all you aqua addicts out there: no need to give up the pleasures of water sports because of the dangers of the sun. With common sense precautions and a good quality sunscreen like Solozone, you can still enjoy a sunny day near the water.

Peter Toohey's A Winner

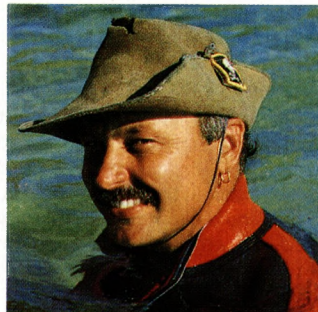
Congratulations to Peter Toohey of Broken Hill, NSW, winner of a dive holiday for two to Lord Howe Island. Peter recently subscribed to *Scuba Diver* and entered the Lord Howe Island competition. Now, he and a friend will fly to this diving paradise where they will have seven nights accommodation and five days diving with tanks, weights, airfills and divemaster services — all courtesy of Sea Life Travel International and *Scuba Diver*. Good diving, Peter!

American audiences included Underwater Australia, Sea Fishes of the South Pacific, Marine Invertebrates of the South Pacific, Dangerous Sea Creatures, Living Together, Underwater Natural History Photography, Photojournalism/ Pictures Into Profits, Sex in the Sea, Shells Alive and Butterflies of the Sea.

The Nikon's Underwater Australia Photographic Exhibition, perhaps the largest travelling underwater photography display in the world, is comprised of some 100 large Cibachrome prints. Part of this exhibition is also included in Coleman's booth at Scuba Expo '90.

Besides promoting diving in Australia and the South Pacific, Coleman was also busy developing a larger export market for his books and *Underwater Geographic* magazine.

The tour reached a finale in Chicago where he was one of the judges for a local underwater photography competition and ran some of his photography workshops at Our World Underwater's twentieth anniversary show.



Neville Coleman Tours the USA

Neville Coleman has just recently returned from lecturing and exhibiting the Nikon's Underwater Australia Photographic Exhibition in the United States. On this trip, he visited Ohio, Illinois and Florida.

Coleman's lecture series, which is well known to most Australian divers, featured several of his more popular marine biology and underwater photography programmes. Titles selected for the



High Pressure NAUI ITC

Aspiring to join one of the elite groups of diving instructors, seven candidates convened on February 22 at Frog Lodge, Shellharbour NSW for the Frog Dive sponsored NAUI ITC.

Michael Aw, a part-time scuba instructor, went along as one of the five staff members. He reports that what followed was 10 days of intense pressure where the participants were tested to their physical and psychological limits. During long days, often from 6.30 am to 9.00 pm, they worked hard to achieve the academic and practical standards set by the course co-ordinators.

On the first day the candidates took a knowledge assessment exam to enable staff members to identify their weak areas. The staff members' task was to strengthen these areas before the final exam.

Staff members acted as team leaders and rehearsed classroom and practical teaching presentation with the candidates. Through the 10 days, each candidate made eight classroom teaching presentations, four confined and four openwater teaching sessions. As an indication of the high standards expected of candidates, all staff members, in assessing their students, had to ask "Will I let this person teach my loved one to dive?"

In this course particular emphasis is placed on rescue techniques; NAUI believes that anyone certified as a diver

should be able to perform the basic skills of rescue on a dive buddy, including surfacing an unconscious diver and performing in-water respiration. A NAUI instructor is required to teach this skill to entry-level students. Once candidates are confident that they can perform the rescue exercise with precision, they ask for a "one try" open-water evaluation.

According to Aw, one of the memorable events of this course occurred after a long open water session when an impromptu missing diver's scenario was staged for the tired group of candidates. The group quickly evaluated the situation and delegated the tasks effectively. Search and recovery was swift; the victim was rescued from the water within eight minutes, complete with CPR and proper accident management procedures.

At the end of the course, staff presented NAUI with six new instructors.

In the USA both government agencies and the private sector hold NAUI Rescue Technique in high esteem. Both Stanford and Temple University have adopted NAUI standards. In Australia all NAUI instructors are accredited as NCAS level 2 coach, enabling them to teach in all government institutions and public schools.

For more information on NAUI ITC in Australia, contact Bob Taylor of Frog Dive on (02) 637 2144.

Sydney Diving Medical Seminars

Prince Henry Hospital's Hyperbaric Unit is offering a series of seminars on "Safe Diving Practices". All divers are encouraged to take the opportunity to learn more about decompression sickness, first aid and management, retrieval of diving casualties, equipment maintenance, women in diving and the DSAT/PADI RDP, all topics that will be covered in the seminars.

Seminar dates for the second half of 1990 are 10th September and 12th November 12th. The seminars will take place between 6 and 10 pm, and a light supper will be provided. For a nominal fee, attendees can benefit from the knowledge of expert lecturers on these vital subjects.

For inquiries and booking arrangements, contact: Sue Sheeran, Hyperbaric Unit, Prince Henry Hospital, PO Box 233, Matraville, NSW 2036. Telephone (02) 694 5749.

caught on film

by Michael Cufer

Forced Perspective

Wide-angle photography produces some interesting results, but none more than a technique known as "forced perspective". The standard lens, such as the 35mm Nikonos, sees much the same as the human eye, so that everything appears in normal perspective.

A wide-angle lens alters this perspective, making near subjects seem closer and larger while distant objects seem further away and smaller. Understanding this becomes a useful technique that photographers can use to achieve surprising results.

A simple example of forced perspective is the wide-angle mirror. By viewing your image from a distance of a few feet, your reflection is much smaller than life. Decrease that distance to a few inches, and the reflection becomes several times larger than the original.

The best wide-angle lenses are those that enable you to get as close as 30cm from the subject. Most lenses from a 20mm down will suit. For example, the 15mm Nikonos has a picture angle of 94 degrees and focuses down to less than 30cm. The Sea and Sea 16mm conversion lens simply screws on to the Nikonos 35mm. With a picture angle of 91 degrees and a minimum focus of

less than 30cm, this lens is a good introduction to forced perspective.

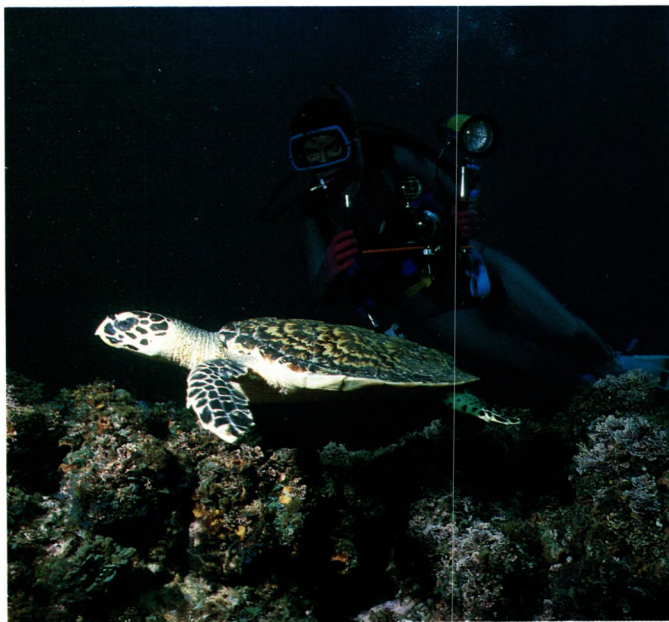
A large depth of field is important. The wider the lens, the greater the focal range; the smaller the aperture, the better the depth of field. A lens such as the 15mm Nikonos focuses between 30cm and infinity at an aperture of $f/22$ by manipulating the depth of field indicators around those distances. Without this depth of field, wide-angle forced perspective photography isn't so effective. If you don't require an infinite focus range, larger apertures such as $f/16$, $f/11$ and $f/8$ can still be used, especially if visibility is poor.

Since such small apertures are required to obtain the best depth of field, shooting upward is a good method of exposing negative background space to achieve a good size comparison with the far subject. The near subject can be anything from a fish to a featherstar. Remembering forced perspective gives a false size perspective, choose familiar subjects.

For example, if you put a mado in the background and a diver in the foreground, perspective will seem correct regardless of the lens used because the mado is a small fish. But, place the mado near the lens and the diver a few



By bringing the subject in the foreground close to the lens, you can create the impression that it's much larger. Wendy is only half a metre behind the crinoid, but it appears three times larger because of forced perspective.



A hawksbill turtle that is only 30 centimetres long appears much larger as Wendy positions herself 1.5 metres in the background.

feet away, and the mado will become one hell of a fish.

Shooting upwards has its problems. According to Murphy's Law, the time it takes to successfully compose the shot will exceed your breathholding limit. In forced perspective photography, small bubbles look exactly the same as big bubbles. The only solution to this problem is practice.

A wide-angle strobe is suitable for a wide-angle lens, but for forced perspective some small strobes that illuminate only the near subject may suffice. At apertures around $f/16$ and $f/22$, the strobe power must be set on full. This allows you to get close to the near subject and compose the picture with the furthest subject swimming into position.

Backscatter is a problem with wide-angle strobe photography. Placing the light source away (and slightly forward) from the lens should help. Between 60 and 90cm is sufficient. Parallax error

is also a problem with a viewfinder system such as the Nikonos type. What may appear perfect through the finder can seem terribly wrong through the lens. To avoid a mismatch, lift the whole camera about five centimetres in the direction of the finder.

Another way is to place the camera in position and have your model swim about and lean forward without getting in the picture, using the dome reflection to compose the photo. This isn't always possible, so the first method works best.

Forced perspective is a special effect — a powerful tool in creating the unusual photograph. If you have creative tendencies, the possibilities are endless.

An award-winning photographer and keen diver, Michael Cufer spends his non-diving time writing dive travel and underwater photography articles.



your shot

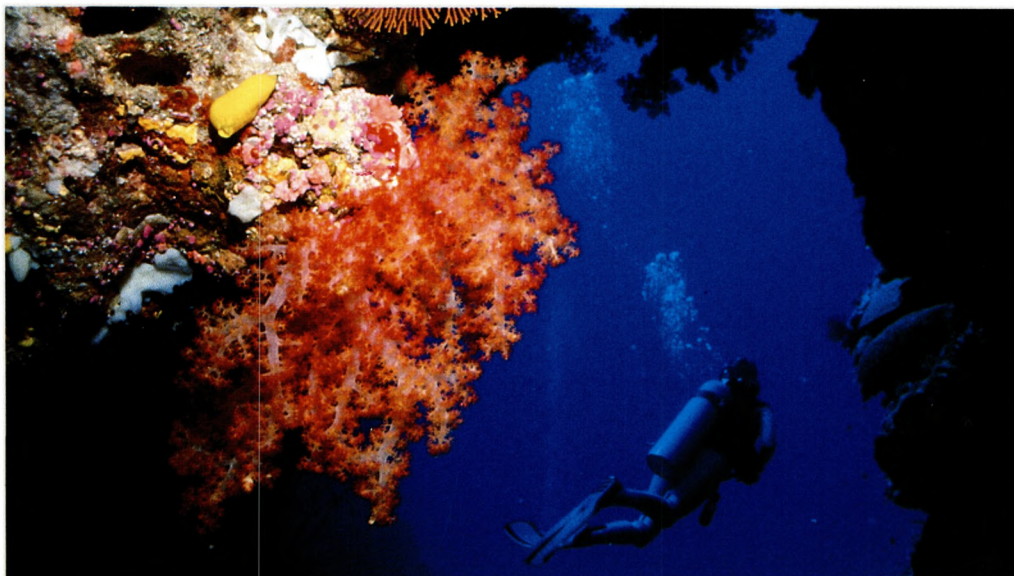
by Maria Kavallaris



Maria Kavallaris of Bondi, NSW captured this shot, which she calls "Puppy Love", of two friendly seals at Montegu Island with a Nikonos IV-A, 28mm lens and SB-101 strobe at 1/90th a second at f/8 using Ektachrome 100 film.

We're looking for some new names in underwater photography, divers who haven't been published before. Contributions to Your Shot should be addressed to the Editor of Scuba Diver and accompanied by photo details and a self-addressed, stamped envelope. Contributors of published shots will receive an incentive package of Kodak film.

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ALL IN ONE.

complete with automatic over-pressure release. Included with the BCJ-1000 is a padded interior with extra lumbar cushioning. Plus a soft double band tank support featuring Tabata's patented cam-buckle assembly, along with a padded velcro cummerbund and adjustable quick release shoulder & chest straps to assure you a comfortable fit. Padded shoulder sleeves and matching bellows pockets are colorful supplements which accommodate any size BCJ-1000.



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